

The Carolinas' Water System

GRAND STRAND

Grand Strand Water and Sewer Authority 2035 Plan

I. EXECUTIVE SUMMARY

During the national economic crisis known as "The Great Recession" the Coastal Carolina region experienced a significant downturn in both residential and commercial real estate development. Although this crisis caused much economic pain, GSWSA was able to work through the recession without a significant change in its operations or customer charges. The good news is that the economy continues to recover and GSWSA's growth rate is returning to a more normal level. We are now adding customers at a similar rate as the early 2000's. If the current trends continue, and we think they will, the service area will continue to grow and prosper.

As we have done in our previous strategic plans, this 2035 plan looks into the history of GSWSA and highlights the significant accomplishments and events that have impacted the Utility and the community it serves. It traces GSWSA from its start in 1971 – chartered with no assets, customers, or revenues - to where it is today: A major water and wastewater utility with over \$701,000,000 in assets, 80,000 customers, and annual revenues of \$87,000,000.

The 2035 Plan also examines our current state of affairs. The Greater Grand Strand is both a major tourist destination and home to a large and growing number of permanent residents. Over 290,000 permanent residents reside in Horry County, and during the summer season, thousands of visitors may be in the county during a given day. The highway transportation network is being rapidly expanded and upgraded through the County's transportation sales tax. Housing, retail, and tourist attractions have returned to a more normal rate. New efforts are being made to recruit industry adding to the area's economic diversification. The area is becoming a more dynamic economic engine. Service areas outside of Horry, Marion, and Dillon counties are still in a recover mode but they are in many ways optimally situated for industrial development. Columbus County in North Carolina also is growing at a very slow rate but as housing expands in Horry County, this area should also see an increase in the housing market.

Although economic conditions were challenging due to the recession, GSWSA remains strong and financially viable. A complimentary retail and wholesale system of services have evolved to meet the needs of the area served and also help stabilize revenues during difficult economic times. Sufficient capacity is in place to meet intermediate growth needs; and capital reserves are in place for future capacity expansions. Customer rates are less and in most cases substantially less than other water and wastewater utilities operating on the coast of South Carolina. Facilities are in good condition using the latest technology available. Most importantly, GSWSA is meeting customer expectations by providing high value products and services.

A major focus of this plan is the capital improvements and financing required to meet customer needs through 2035. Horry County's population is projected to increase to over 393,000 by year 2035, accompanied by an increase in seasonal visitors. The peak water

flow projected for 2035 is over 115 million gallons per day (MGD), and wastewater flow is 75 MGD. Although excess capacity is in place to meet short-term to intermediate needs, major capital improvements will be required over the next 20 years. \$322,836,000 is projected for capital improvements to the water system. Funding for the plan will require only minor increases to impact fees and monthly base charges. \$435,312,500 is projected for capital improvements to the wastewater system. Funding the wastewater improvement plan will also require minor increases to the wastewater impact fees and monthly base charges as well.

The growth in service demands will require other resources in addition to capital improvements. Structural, human resources, and operational requirements are also included in the 2035 Plan. The organizational structure continues to evolve based on the talents of our human resources and the demands of an expanding service area and customer base. We will continue to emphasize hiring highly qualified employees, training, development, and compensation to keep a superior workforce in place and to provide for management succession from within the organization. While additional staff will be required to meet the needs of a rapidly expanding customer base, growth in employees will be much less than overall customer growth. New technologies will continue to be used to provide an effective and efficient level of service to customers.

The financial plan is based on meeting service demands while holding operating cost increases to levels below inflationary indexes and reducing the level of current debt on an actual as well as per customer basis. This will be accomplished by increasing operating efficiencies through a more productive workforce and using the most cost effective technology available in the industry. Debt levels will be reduced by minor increases in impact fees and monthly base charges. Increases in monthly wastewater capital charges will reflect the increased cost associated with more stringent regulatory requirements.

GSWSA's goal is to provide service throughout Horry and surrounding counties while maintaining the lowest rates of any water or wastewater utility operating on the coast of South Carolina. The 2035 Plan outlines how these goals are to be accomplished.

II. INTRODUCTION

The purpose of the 2035 Plan is to look to the future to determine the water and wastewater requirements for Horry County and surrounding communities over the next 20 years in order to effectively and efficiently meet the service needs of our residents, businesses, and visitors. The plan is based in part on the growth projections of the Waccamaw Regional Council of Governments and the Horry County Comprehensive Plan.

The previous county comprehensive plan called for "a safe and adequate public supply of drinking water and water flow sufficient for fire protection purposes throughout the county" and "treatment and disposal of wastewater...in a manner which protects the public health, enhances the efficiency of treatment provision and, preserves the county's natural environment." This 2035 Plan effectively outlines the actions necessary for accomplishing these goals in a very cost effective manner.

The plan is divided into the following parts:

- History of GSWSA
- Philosophy, Values and Strategies for Continued Success
- Current Operations
- Future Plans

III. HISTORY OF GSWSA

A. Historical Perspective

The 1950 census recorded 59,820 residents in Horry County. Most of these residents lived on tobacco farms, which were the county's largest income producer. Tourism was in its infancy. Vacationers stayed in seaside cottages and small motels along the Grand Strand. In 1954, Hurricane Hazel destroyed many of the cottages and with them part of the small community atmosphere. The cottages and motels were replaced with ocean front hotels and restaurants. Golf courses and other tourist attractions began to appear on the landscape. The 1960 census recorded 68,247 county residents, an increase of nearly ten thousand from the 1950 census. However, following the rapid increase in population after Hurricane Hazel, the 1960's were a time of consolidating growth. During the decade of the 60's the county population grew just slightly to 69,992. This period of consolidation did, however, lay the groundwork for dramatic growth during the next three decades. By 1980, the permanent population in Horry County had grown to 101,419 and to 145,300 by 1990. This dramatic growth continued during the 1990's and the 2010 census recorded 269,291 residents living in Horry County. This population growth told only part of the story.

Horry County Population Growth							
Year	1950	1960	1970	1980	1990	2000	2010
Population	59,820	68,247	69,992	101,419	145,300	196,630	269,291

How does GSWSA fit into this story? A close look at the population growth indicates the county's ability to add to its permanent population was constrained during the 1960's, which saw an increase in population of just 2.6 percent from 1960 to 1970. The county had limited water and wastewater infrastructure, which was confined to the relatively small areas inside the city limits of Myrtle Beach, North Myrtle Beach, Conway, and Loris. New developments were springing up outside these municipalities but were restricted by either on-site sanitary facilities or small private water and wastewater systems. Over fifty private water and wastewater systems were located along the Grand Strand. The track record of these small private systems was less than reliable which led to increasing regulatory concerns for general sanitation, environmental protection, and conservation of the area's natural resources.

B. Charter and Start-up

In the late 1960's, it became apparent that Horry County needed public water and wastewater facilities outside the municipalities to support growth and economic development. In 1971, the General Assembly of South Carolina created Grand Strand Water and Sewer Authority (GSWSA) to provide water and wastewater services to Horry

County in the area between the Atlantic Ocean and the Atlantic Intracoastal Waterway (AIWW) excluding areas served by incorporated municipalities. In 1972, the Horry Water and Sewer Authority (HWSA) was similarly established to provide water and wastewater services in the area west of the AIWW excluding areas served by incorporated municipalities. The enabling legislation gave these Authorities broad powers for providing water and wastewater services. However, no funding or taxing authority was given to the utilities.

In the early years, GSWSA acquired many small private systems serving the developing areas. Most of these systems had regulatory and financial problems which allowed GSWSA to acquire them at minimal costs. From these small systems, GSWSA began to piece together a consolidated utility system in its rapidly developing service area.

C. 201 Program

In 1971, the Federal Water Pollution Control Act created the Environmental Protection Agency and established funding to upgrade the nation's publicly owned wastewater treatment works to a minimum standard of secondary treatment. The program provided seventy-five percent grants toward construction of new wastewater treatment facilities provided certain criteria were met. These criteria outlined in section 201 of the act required the creation of facility improvement plans using twenty year growth projections. In 1974, GSWSA was designated as the lead 201 Planning and Management Agency for the coastal areas of Horry and Georgetown Counties. The intent was to develop comprehensive regional facilities plans in order to assure the federal funds allocated to the projects were spent in the most cost effective and environmentally sound manner. In the course of preparing the plans, many alternatives were considered. However, in most cases the plans recommended separate treatment facilities for each of the wastewater providers. These 201 Facilities Plans resulted in the construction of major wastewater treatment facilities to serve the City of North Myrtle Beach, the City of Myrtle Beach, and two facilities to serve GSWSA - a regional facility in the southern part of the county east of the AIWW and a regional facility in the northern part of the county just west of the AIWW. Additionally, in the western part of the county both the Cities of Conway and Loris constructed facilities under the 201 program. All total, over \$80,000,000 was spent in Horry County to construct wastewater treatment facilities under the 201 program of which over 75 percent came directly from the federal government. The 201 program gave GSWSA the opportunity to connect and consolidate many of its small wastewater systems into regional systems serving the eastern portion of the county.

D. Merger of Authorities

Shortly after their creation, it became apparent that the AIWW would not serve as an appropriate service area boundary between GSWSA and HWSA. Although most of the development was east of the AIWW, the area between the AIWW and the Waccamaw River was also developing. Due to rapid development in GSWSA's service area and the proactive nature of its leadership, GSWSA was acquiring facilities, customers, qualified employees, and the general wherewithal to provide service to additional areas; whereas, HWSA had no customers, facilities, or employees and therefore did not develop the capability to provide services. Recognizing the economic potential of the area, in 1975

Horry County Government enlarged GSWSA's service area to include all areas between the Atlantic Ocean and the Waccamaw River excluding areas served by municipal systems. In subsequent years, GSWSA continued to grow and develop as a responsible, responsive, and progressive water and wastewater utility, while HWSA struggled with no assets, customers, or staff. In order to encourage growth and economic development in the western part of the county, in 1986, Horry County Government consolidated GSWSA and HWSA into a single special purpose district designated as Grand Strand Water and Sewer Authority. The service area of GSWSA was expanded to include all the 1,000 square mile plus geographic area of Horry County, excluding any area within an incorporated municipality owning and operating a waterworks and/or wastewater system and further excluding all areas within the service area of Little River Water and Sewerage Company, Inc., as well as excluding the area served by Bucksport Water Company, Inc. for water service only.



E. Health Hazard Elimination

In 1986, just after GSWSA acquired the service area in the western part of the county, the South Carolina Department of Health and Environmental Control (DHEC) designated the Bucksport and Longs communities as imminent health hazards because of the large number of failing septic tanks in these areas. West of the Waccamaw River, very little public wastewater facilities existed outside the city limits of Conway and Loris. Providing service to the Bucksport and Longs communities required starting from scratch. GSWSA obtained funding through federal, state, and local governments to install wastewater collection systems and treatment facilities in these communities. In all, over 500 households received wastewater service within 24 months of GSWSA receiving authority to provide service to these areas. With the aid of a DHEC sponsored construction grant, a grant from the Federal Farmers Home Administration, Community Development Block Grants, and its own resources, GSWSA spent over \$6,000,000 to eliminate these health hazards. At the time, these areas were rated among the most severe imminent health hazards in the State of South Carolina. Since that time, GSWSA has worked with local, state, and federal officials to install wastewater systems in other areas of the county designated as either imminent health hazards or environmentally distressed communities. These included the Burgess community, extensions of the systems in the Bucksport and Longs communities, the Cedar Branch community, and the Bennettown community. Well over 1,500 households have received water and/or wastewater service through these projects.



F. The Bull Creek Regional Water System

Until the mid 1980's, all public water in Horry County was supplied through deep water wells primarily drilled into the Black Creek aquifer. As the county's population and tourism industry grew, the withdrawal rates began to strain the aquifer such that salt water was beginning to intrude into the fresh ground water supplies. In addition, water from the Black Creek aquifer was high in fluoride concentration which caused discoloration in children's teeth.

In 1984, GSWSA prepared a regional water plan for Horry County and the Waccamaw Neck area of Georgetown County recommending the construction of a surface water treatment plant located on Bull Creek. Bull Creek was recommended because it was the source of large quantities of high quality water. The plan was a few years ahead of its time and was not implemented in part because the City of Myrtle Beach, a large user of water, decided to construct a surface water treatment plant within the city on the AIWW. Myrtle Beach had a dwindling ground water supply, and the city felt it was in their best interest to construct a plant to serve just their needs.

In 1986, the federal government passed amendments to the Safe Drinking Water Act which lowered the fluoride limits below the level that could be met from the ground water supply from the Black Creek aguifer. GSWSA reinitiated its proposal for a regional surface water treatment plant. The Cities of North Myrtle Beach, Conway, Surfside Beach, Aynor, Loris, and the water utilities of Little River Water and Sewerage Company (LRWSC), Bucksport Water Company, and Georgetown County Water and Sewer District (GCWSD) were invited to participate. After months of negotiations, Surfside Beach, Conway, LRWSC, Aynor, and Loris chose to fully participate in a regional water system. However, North Myrtle Beach chose to purchase water from Myrtle Beach. GCWSD chose to build its own plant on the Waccamaw River but participated in the Bull Creek project for the Murrells Inlet portion of its service area. Bucksport chose to remain on ground water supply even though it could not meet the secondary standards for fluoride. The total project cost approached \$50,000,000, the largest financial undertaking and most complex project GSWSA had ever undertaken. The project was completed ahead of schedule and below budget. From the initial startup, the plant reliably produced high quality drinking water for GSWSA and other participants. In short, the project was a huge success.



G. Service to New Developments

Since GSWSA was chartered without funding, taxing authority, or any apparent outside source of revenues, the cost of providing service to new developments has necessarily and appropriately been at the expense of the developer. In the very early years, cost sharing approaches were used for offsite facilities with the developers installing the internal or onsite improvements. Over the years, a very comprehensive set of specifications and guidelines has been developed in order to systematically handle new development. In the early 80's, impact fees became a part of the rate and cost of service structure in order to ensure that each customer was paying a proportionate share of the capital costs for transmission and treatment facilities. GSWSA has refined this policy over the years and now has a system in place to provide off-site improvements to service new development provided the developer pays the capital cost in impact fees necessary to support the project. Developers continue to install their internal improvements to GSWSA at the completion of construction for operation, maintenance, and service to the new customers.

H. Service to Rural Communities

In the early years, expanding service to existing residents and communities was usually handled on a case by case basis. If a community needed water service, costs were proportionally allocated to the existing and potential future customers. Many communities received service in this manner. However, this funding method was not an adequate mechanism for providing water and wastewater service to meet all the existing community needs. A more systematic basis was needed that would incorporate an equitable and uniform cost structure for serving the rural communities as well as providing a systematic method for determining when, where, and in what priority the communities would get service. Using several million dollars in surplus bond funds from the Bull Creek project as seed money, a rural program was established with a key criteria of having a minimum of 10 customers per mile petition for service before lines would be extended. Since establishing the rural program in 1992, over \$32,000,000 has been spent installing lines to approximately 11,500 new customers. In addition to providing drinking water service, a major benefit of the program is water for fire flow protection in the rural areas. Lines installed in the rural areas are sized at a minimum required to support fire hydrants.

Similarly, GSWSA established the criteria of a minimum of 10 customers per mile for extending wastewater service into the rural areas of the county. In urban areas, large diameter gravity sewer collection lines are laid on grade connecting to large pumping stations serving entire communities. Because of the lack of population densities, this type system is not feasible in rural areas. To provide service to the rural communities, small residential pumping stations are used. These units have proven to be a reliable and cost effective method of providing wastewater service to the rural areas of the county. Since initializing the rural sewer program in 1997, over \$39,000,000 has been spent providing service to 6,400 customers.

I. Mergers and Acquisitions

The success of the Bull Creek Regional System brought changes to the working relationships between GSWSA and the other water and wastewater utilities in Horry County. Both the success of the initial project and the ongoing quality and cost of service allowed for the formation of stronger relationships that could be built upon for future cooperative arrangements.

Although Surfside Beach was a wholesale water and wastewater customer, it could not obtain an efficient economy of scale in its retail operation. This resulted in a higher cost of service for residents of Surfside. In 1995, the Town held a referendum to sell its water and wastewater system to GSWSA. The referendum passed by an overwhelming majority.

The Town of Aynor was also receiving wholesale water service but did not have a wastewater system within the town. Many of the septic tanks in town were either failing or operating unreliably. Because of the poor soils, DHEC was not issuing septic tank permits in Aynor which was limiting growth in the town. In 1998, the town held a referendum to sell its water system to GSWSA in exchange for the installation of a wastewater system. This referendum also passed by an overwhelming majority. GSWSA installed a wastewater system throughout Aynor, and the town has since experienced unprecedented growth.

In 1994, as a result of its wastewater discharge permit violations, Conway was placed under a wastewater moratorium by DHEC. GSWSA offered to acquire the plant and upgrade the facility to meet the permit requirements. Conway agreed to the proposal, and the plant has since been upgraded, rebuilt, and expanded from 2 to 4 MGD. The City of Conway is now a wholesale customer for both water and wastewater services.

In 2000, the Cities of Myrtle Beach and North Myrtle Beach, acting jointly, purchased 4 MGD of water capacity. The water is delivered to North Myrtle Beach at the Barefoot Landing Resort.

In 2000, North Myrtle Beach purchased 3 MGD of wastewater capacity to serve both the area the city annexed west of the waterway and areas of the city east of the waterway. This is about forty percent of the city's wastewater capacity.

In 2001, the City of Loris was violating its wastewater discharge permit. GSWSA acquired the Loris plant and has upgraded the facility to meet the permit requirements. The City of Loris is also now a wholesale customer for both water and wastewater services.

In 2006, GSWSA acquired the City of Myrtle Beach's water and wastewater plants with the city becoming a wholesale water and wastewater customer. This was a large acquisition resulting in expansion of annual revenues of over thirty-five percent. Myrtle Beach City employees involved in water/wastewater plant operations transferred to GSWSA.

In 2008, a wastewater service area was acquired in Columbus County, North Carolina. This was quickly followed by installation of a main wastewater line to service two schools in the area. Another project has been completed which installed a system to eliminate failing septic tanks for a large community in the area.

In 2008, GSWSA acquired the wastewater system in the Town of Sellers in Marion County. The small town had a wastewater collection system feeding a failing land application system. GSWSA negotiated a contract with the Town of Latta in Dillon County to treat wastewater from Sellers. A project was completed which installed a wastewater line connecting Sellers to the Latta WWTP. Today GSWSA now operates in five counties in South and North Carolina.

In 2010, GSWSA acquired the City of Marion's water and wastewater system. This is a mid-size system serving over 3,330 customers with annual revenues of over \$2,000,000. The City of Marion is the Marion County seat and centrally located within the county. The system has excess water and wastewater capacity and the acquisition will lower customer costs and promote economic development in the area.

GSWSA also acquired the Town of Nichols in 2010 as well as the Centenary sewer system. In 2012, GSWSA acquired the Town of Mullins in Marion County and the Town of Lake View in Dillon County.

All the acquisitions of municipal systems occurred following a referendum of the municipal voters and in all cases the vote was overwhelmingly positive to transfer the systems to GSWSA.

J. Customer and Financial Growth

Starting in 1971 with no assets, income, or customers, GSWSA began acquiring small private systems at little or no costs and pursuing State and Federal grants to extend the systems to add new customers. Gradually this piecemeal utility system began to come together. By 1980, assets totaled \$45,800,121, annual revenues were \$2,312,244, and the customer base had grown to over 5,000. These early disconnected systems provided the framework to add facilities and to accommodate the rapid growth and development taking place in Horry County. During the next two decades, GSWSA was constantly expanding its systems to support this unprecedented growth.





K. Board of Directors History

This Strategic Business Plan has several purposes, one of which is to be mindful of our history in order to better plan for our future. With this in mind the following is a summary of our Board of Directors from GSWSA's inception in 1971. We are hopeful this information will be carried forward in future plans.

Board of Directors – 1971

- 1. Johnny Squires
- 2. Rayford Vereen
- 3. J. Lambert Schwartz
- 4. Dick Elliott
- 5. WJ Williams

Board of Directors – 1974

- 1. Johnny Squires
- 2. Rayford Vereen
- 3. J. Lambert Schwartz
- 4. Dick Elliott

Board of Directors – 1975

- 1. Johnny Squires
- 2. Rayford Vereen
- 3. J. Lambert Schwartz
- 4. Dick Elliott
- 5. Cecil Clarkson

Board of Directors – 1977

- 1. Johnny Squires
- 2. Rayford Vereen
- 3. J. Lambert Schwartz
- 4. Cecil Clarkson
- 5. Wayne Baker
- 6. Lloyd Conner

Board of Directors – 1982

- 1. Rayford Vereen
- 2. J. Lambert Schwartz
- 3. Cecil Clarkson
- 4. Edwin Navey
- 5. F. Delano Sanders
- 6. Sidney Thompson

- 1. Rayford Vereen
- 2. J. Lambert Schwartz
- 3. Edwin Navey
- 4. F. Delano Sanders
- 5. Sidney Thompson
- 6. Egerton Burroughs

Board of Directors – 1987

- 1. Rayford Vereen
- 2. J. Lambert Schwartz
- 3. Edwin Navey
- 4. F. Delano Sanders
- 5. Sidney Thompson
- 6. Egerton Burroughs
- 7. E. Gene Anderson
- 8. John Griggs
- 9. Wayne Jordan

Board of Directors – 1989

- 1. J. Lambert Schwartz
- 2. Edwin Navey
- 3. Sidney Thompson
- 4. E. Gene Anderson
- 5. John Griggs
- 6. Wayne Jordan
- 7. James Dewitt
- 8. Jimmy Thompkins
- 9. Benjy Hardee

Board of Directors – 1992

- 1. J. Lambert Schwartz
- 2. Edwin Navey
- 3. Sidney Thompson
- 4. E. Gene Anderson
- 5. John Griggs
- 6. Wayne Jordan
- 7. James Dewitt
- 8. Benjy Hardee
- 9. Bridget Fata

- 1. Sidney Thompson
- 2. E. Gene Anderson
- 3. John Griggs
- 4. Wayne Jordan
- 5. James Dewitt
- 6. Benjy Hardee
- 7. Jesse Ward

Board of Directors – 1994

- 1. Sidney Thompson
- 2. E. Gene Anderson
- 3. John Griggs
- 4. Wayne Jordan
- 5. James Dewitt
- 6. Benjy Hardee
- 7. Jesse Ward
- 8. Arnold Johnson
- 9. David Singleton

Board of Directors – 2001

- 1. Sidney Thompson
- 2. John Griggs
- 3. James Dewitt
- 4. Benjy Hardee
- 5. Jesse Ward
- 6. Arnold Johnson
- 7. David Singleton
- 8. Robert Floyd, Jr.
- 9. Kristen Hardee

Board of Directors – 2005

- 1. Sidney Thompson
- 2. John Griggs
- 3. James Dewitt
- 4. Benjy Hardee
- 5. Arnold Johnson
- 6. David Singleton
- 7. Robert Floyd, Jr.
- 8. Kristen Hardee

- 1. Sidney Thompson
- 2. John Griggs
- 3. James Dewitt
- 4. Benjy Hardee
- 5. Arnold Johnson
- 6. David Singleton
- 7. Robert Floyd, Jr.
- 8. Kristen Hardee
- 9. Liston Wells

Board of Directors - 2007

- 1. Sidney Thompson
- 2. John Griggs
- 3. James Dewitt
- 4. Benjy Hardee
- 5. Arnold Johnson
- 6. David Singleton
- 7. Robert Floyd, Jr.
- 8. Liston Wells
- 9. Wilbur James

Board of Directors – 2009

- 1. Sidney Thompson
- 2. John Griggs
- 3. Benjy Hardee
- 4. Arnold Johnson
- 5. David Singleton
- 6. Robert Floyd, Jr.
- 7. Liston Wells
- 8. Wilbur James
- 9. Robert Rabon

Board of Directors - 2011

- 1. Sidney Thompson
- 2. John Griggs
- 3. Benjy Hardee
- 4. Arnold Johnson
- 5. Robert Floyd, Jr.
- 6. Liston Wells
- 7. Wilbur James
- 8. Robert Rabon

- 1. Sidney Thompson
- 2. John Griggs
- 3. Benjy Hardee
- 4. Arnold Johnson
- 5. Robert Floyd, Jr.
- 6. Liston Wells
- 7. Wilbur James
- 8. Robert Rabon
- 9. Richard Singleton

L. Horry County Legislative Delegation History

	House of Representatives	Senators
Delega	ition – 1971 Charles F. Hodges	James Stevens
2	Sidney T. Floyd	
2. 3	John W Jenrette Jr	
4.	Phillip D. Sasser	
Delega	ntion – 1973	James Stevens
1.	James B. Van Osdell	
2.	Charles E. Hodges	
3.	Sidney T. Floyd	
Delega	tion – 1975 (Redistricting Law of	James Stevens
1974)		
1.	District 103 – James B. Van Osdell	
2.	District 104 – Charles E. Hodges	
3.	District 105 – Sidney T. Floyd	
4.	District 106 – T. Basil Barrineau	
Delega	ntion — 1977	Ralph Ellis
1.	District 103 – Jean B. Myers	
2.	District 104 – Charles E. Hodges	
3.	District 105 – M. Lois Eargle	
4.	District 106 – T. Basil Barrineau	
Delega	ntion — 1979	Ralph Ellis
1.	District 103 – Jean B. Myers	-
2.	District 104 – Charles E. Hodges	
3.	District 105 – M. Lois Eargle	
4.	District 106 – Julian A. Reynolds	

	House of Representatives	Senators
Delega	ntion – 1985	J. M. "Bud" Long
1.	District 104 – Dick Elliott	C C
2.	District 105 – Liston D. Barfield	
3.	District 106 – Benjamin E. Thraikill, Jr.	
4.	District 107 – H.E. Pearce, Jr.	
Delegation – 1989		J. M. "Bud" Long
1.	District 104 – Dick Elliott	
2.	District 105 – Liston D. Barfield	
3.	District 106 – Thomas G. Keegan	
4.	District 107 – Kenneth S. Corbett	
Delega	ition – 1991	J. M. "Bud" Long
1.	District 104 – Dick Elliott	
2.	District 105 – L. Morgan Martin	
3.	District 106 – Thomas G. Keegan	
4.	District 107 – Kenneth S. Corbett	
Delegation – 1993		Luke Rankin
1.	District 58 – L. Morgan Martin	Dick Elliott
2.	District 103 – John J. Snow, Jr.	
3.	District 104 – Harold Gene Worley	
4.	District 105 – William D. Witherspoon	
5.	District 106 – Thomas G. Keegan	
6.	District 107 – Mark S. Kelley	
Delega	ntion – 1995	Luke Rankin
1.	District 58 – L. Morgan Martin	Dick Elliott
2.	District 103 – Theodore A. Brown	
3.	District 104 – Harold Gene Worley	
4.	District 105 – William D. Witherspoon	
5.	District 106 – Thomas G. Keegan	
6.	District 107 – Mark S. Kelley	
Delega	ntion – 1997	Luke Rankin
1.	District 58 – Liston D. Barfield	Dick Elliott
2.	District 103 – Theodore A. Brown	
3.	District 104 – Tracy R. Edge	
4.	District 105 – William D. Witherspoon	
5.	District 106 – Thomas G. Keegan	
6.	District 107 – Mark S. Kelley	

7. District 108 – Vida O. Miller

	House of Representatives	Senators
Delega	tion – 1999	Luke Rankin
1.	District 58 – Liston D. Barfield	Dick Elliott
2.	District 104 – Tracy R. Edge	
3.	District 105 – William D. Witherspoon	
4.	District 106 – Thomas G. Keegan	
5.	District 107 – Mark S. Kelley	
6.	District 108 – Vida O. Miller	
Delegation – 2003		Luke Rankin
1.	District 55 – Jackie E. Hayes	Dick Elliott
2.	District 58 – Liston D. Barfield	
3.	District 68 – Thad T. Viers	
4.	District 104 – Tracy R. Edge	
5.	District 105 – William D. Witherspoon	
6.	District 106 – Thomas G. Keegan	
7.	District 107 – Alan D. Clemmons	
Delega	tion – 2005	Luke Rankin
1.	District 55 – Jackie E. Haves	Dick Elliott
2.	District 58 – Liston D. Barfield	
3.	District 68 – Thad T. Viers	
4.	District 104 – Tracy R. Edge	
5.	District 105 – William D. Witherspoon	
6.	District 106 – Nelson L. Hardwick	
7.	District 107 – Alan D. Clemmons	
Delega	tion – 2005	Luke Rankin
1.	District 55 – Jackie E. Haves	Dick Elliott
2.	District 58 – Liston D. Barfield	
3.	District 68 – Thad T. Viers	
4.	District 104 – Tracy R. Edge	
5.	District 105 – George M. Hearn	
6.	District 106 – Nelson L. Hardwick	
7.	District 107 – Alan D. Clemmons	
Delega	tion – 2013 (Redistricting)	Luke Rankin
1.	District 55 – Jackie E. Haves	Greg Hembree
2.	District 56 – Mike Ryhal	8
3.	District 57 – J. Wayne George	
4.	District 58 – Liston D. Barfield	
5.	District 68 – Heather A. Crawford	
6.	District 103 – Carl L. Anderson	
7.	District 104 – Tracy R. Edge	
8.	District 105 – Kevin Hardee	
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9. District 106 – Nelson L. Hardwick10. District 107 – Alan D. Clemmons

House of Representatives

Delegation – 2015

- 1. District 55 Jackie E. Hayes
- 2. District 56 Mike Ryhal
- 3. District 57 J. Wayne George
- 4. District 58 Jeffrey E. Johnson
- 5. District 68 Heather A. Crawford
- 6. District 103 Carl L. Anderson
- 7. District 104 Gregory D. Duckworth
- 8. District 105 Kevin Hardee
- 9. District 106 Nelson L. Hardwick
- 10. District 107 Alan D. Clemmons

IV. PHILOSOPHY, VALUES AND STRATEGIES FOR CONTINUED SUCCESS

Whom the gods would destroy, they first grant forty years of business success - Peter Drucker

Success in the past is no guarantee for success in the future. The unthinkable can happen. Organizations can make themselves irrelevant and from there out of business.

What do the following companies have in common?

Anaconda, American Brands, F. W. Woolworth, International Harvester, International Nickel, John-Mansfield, Swift, United Carbide.

All were members of the Dow Jones Industrial Average when GSWSA was created in 1971. However, none of these businesses are currently operating as independent corporations. In fact, of the 30 members of the 1971 Dow Jones Industrial Average, only four are still on the list: DuPont, Exxon, General Electric, and Proctor and Gamble. Times change, and only those organizations that adapt survive.

For GSWSA to continue to be successful, it must continue to anticipate changes in both its service community and in its industry. GSWSA is in a very personal service business, delivering water into homes and businesses and receiving and removing the resulting wastewater by-product streams. These products and services directly affect the health and safety of customers as well as the environment in which customers live. Few industries deal with customers on a more personal basis.

Since water and wastewater services are directly related to health, safety, and the preservation of our environment, the industry is also one of the most heavily regulated. The trend is for regulations to get more and more stringent with each permitting cycle.

Adapting to the changes in both the expectations of customers and the ongoing tightening of regulations is the biggest challenge facing GSWSA.

Luke Rankin Greg Hembree

Senators

To face this challenge, GSWSA must be focused with a clear sense of purpose. The following statements provide GSWSA's purpose, focus, and strategy for meeting the challenges in the years ahead.

A. Mission

To provide water and wastewater services that protects public health and the environment, promotes economic development and enhances each customer's quality of life.

B. Vision

To expand our mission for water and wastewater services within our region, to be the preferred provider and regional leader in quality and cost of services.

C. Values

- Providing customers high quality products and services at reasonable and affordable rates.
- Providing products and services that protect the public health and environment and exceed state, federal and public health requirements.
- Continuously searching for ways to improve products and services by being flexible and open to change.
- Using technology to improve products and services as well as lowering costs.
- Actively seeking stakeholder understanding and support.
- Educating employees and customers on products, services and policies to increase quality of customer service.
- Conducting business in an ethical manner.

D. Effective Utility Management (EUM)

In 2009, Raftelis Financial Consultants was engaged to assist and facilitate Grand Strand Water and Sewer Authority in an Effective Utility Management (EUM) assessment. EUM is a comprehensive approach to help utilities respond proactively to both current and future challenges. Developed by a consortium of six water and wastewater industry associations and the United States Environmental Protection Agency, EUM practices have been developed to support utilities as they seek to position themselves as successful 21st century service providers. The assessment compared GSWSA's operating practices with the EUM's *Ten Attributes of Effectively Managed Utilities* and the *Five Keys to Management Success*, which are the following:

Ten Attributes of Effectively Managed Utilities

1. **Product Quality**: "Produces potable water, treated effluent, and process residuals in full compliance with regulatory and reliability requirements and consistent with customer, public health, and ecological needs."

- 2. **Employee and Leadership Development**: "Recruits and retains a workforce that is competent, motivated, adaptive, and safe-working. Establishes a participatory, collaborative organization dedicated to continual learning and improvement. Ensures employee institutional knowledge is retained and improved upon over time. Provides a focus on and emphasizes opportunities for professional and leadership development and strives to create an integrated and well-coordinated senior leadership team."
- 3. **Financial Viability**: "Understands the full life-cycle cost of the utility and establishes and maintains an effective balance between long-term debt, asset values, operations and maintenance expenditures, and operating revenues. Establishes predictable rates—consistent with community expectations and acceptability—adequate to recover costs, provide for reserves, maintain support from bond rating agencies, and plan and invest for future needs."
- 4. **Community Sustainability**: "Is explicitly cognizant of and attentive to the impacts its decisions have on current and long-term future community and watershed health and welfare. Manages operations, infrastructure, and investments to protect, restore, and enhance the natural environment; efficiently uses water and energy resources; promotes economic vitality; and engenders overall community improvement. Explicitly considers a variety of pollution prevention, watershed, and source water protection approaches as part of an overall strategy to maintain and enhance ecological and community sustainability."
- 5. **Stakeholder Understanding and Support**: "Engenders understanding and support from oversight bodies, community and watershed interests, and regulatory bodies for service levels, rate structures, operating budgets, capital improvement programs, and risk management decisions. Actively involves stakeholders in the decisions that will affect them."
- 6. **Customer Satisfaction**: "Provides reliable, responsive, and affordable services in line with explicit, customer-accepted service levels. Receives timely customer feedback to maintain responsiveness to customer needs and emergencies."
- 7. **Operational Optimization**: "Ensures ongoing, timely, cost-effective, reliable, and sustainable performance improvements in all facets of its operations. Minimizes resource use, loss, and impacts from day-to-day operations. Maintains awareness of information and operational technology developments to anticipate and support timely adoption of improvements."
- 8. **Operational Resiliency**: "Ensures utility leadership and staff work together to anticipate and avoid problems. Proactively identifies, assesses, establishes tolerance levels for, and effectively manages a full range of business risks (including legal, regulatory, financial, environmental, safety, security, and natural disaster-related) in a proactive way consistent with industry trends and system reliability goals."

- 9. **Infrastructure Stability**: "Understands the condition of and costs associated with critical infrastructure assets. Maintains and enhances the condition of all assets over the long-term at the lowest possible life-cycle cost and acceptable risk consistent with customer, community, and regulator-supported service levels, and consistent with anticipated growth and system reliability goals. Assures asset repair, rehabilitation, and replacement efforts are coordinated within the community to minimize disruptions and other negative consequences."
- 10. Water Resource Adequacy: "Ensures water availability consistent with current and future customer needs through long-term resource supply and demand analysis, conservation, and public education. Explicitly considers its role in water availability and manages operations to provide for long-term aquifer and surface water sustainability and replenishment."

Five Keys to Management Success

- 1. Leadership: "Critical to effective utility management particularly in the context of driving and inspiring change within an organization."
- 2. **Strategic Business Planning**: "An important tool for achieving balance and cohesion across the Attributes."
- 3. **Organizational Approaches**: "Contribute to overall effective utility management that are critical to the success of management improvement efforts."
- 4. **Measurement**: "Critical to the management improvement efforts associated with the Attributes."
- 5. **Continual Improvement Management Framework**: "A plan, do, check, act framework."

As a result of this assessment, GSWSA's future strategic direction in regards to each major attribute is provided.

1. Water Quality

Core Strategies

- Produce and deliver high quality water consistent with customer expectations and exceeding public health requirements.
- Provide treatment exceeding regulatory requirements and meeting the more stringent guidelines of the EPA and SCDHEC Area-wide Optimization Program.
- Operate and maintain distribution facilities to exceed regulatory requirements for quality, quantity and pressure throughout the system.
- Enhance water distribution model to improve ability to identify pressure, quantity and quality needs and to evaluate alternatives for improvement.

- Develop and implement plans and practices to ensure production and delivery of high quality water to customers.
- Pursue program improvements that protect the distribution system from damage by outside forces.

2. Wastewater Quality

Core Strategies

- Collect, treat, and dispose wastewater consistent with customer expectations, exceeding public health requirements and exceeding state and federal requirements.
- Develop and implement plans and practices to ensure safe and reliable collection, treatment and disposal of wastewater.
- Use hydraulic and process models to evaluate technologies, improve wastewater treatment and maintain adequate capacity in the wastewater system.
- Provide for beneficial reuse of all water and wastewater treatment residuals and increase reuse of treated effluent.

3. Customer Satisfaction

Core Strategies

- Provide reliable and responsive services to customers.
- Provide affordable and stable rates to customers. Analyze rates, conduct financial analyses and seek ways to increase revenues and decrease expenses to sustain affordable rates.
- Make use of available technology to enhance customer service.
- Ensure customers are billed correctly, timely, consistent and respond quickly to known problems and/or errors.
- Ensure meters and related equipment is working properly to provide the most reliable information.
- Educate employees and customers on products, services and policies to increase quality of customer service.
- Actively solicit timely customer feedback and seek ways to better serve customers through customer calls and visits, the Citizens Advisory Committee, communication with the Board of Directors, employees, monthly new customer surveys and through the semi-annual customer survey.
- Ensure procedures are in place, documented, continuously reviewed and evaluated for effective response to customer needs and emergencies.

4. Employee Leadership/Development

Core Strategies

• Recruit and retain a competent and stable workforce with a team of long-term, well-trained and loyal employees.

- Nurture a collaborative organization dedicated to continual learning and improvement.
- Maintain an integrated and well-coordinated leadership team that has longevity and experience, and that promotes mutual trust and positive working relationships.
- Recruit a competent workforce by creating systematic hiring practices to ensure hiring of the best possible employees and by providing competitive salaries and benefits.
- Provide effective communication of direction and performance evaluation with each employee. Evaluate the employee's job position and compare the position requirements to the employee's skills, knowledge and abilities.
- Provide employees with the necessary skills to meet current and future job demands by providing internal and external training, especially in leadership, operations, financial, safety, and customer service.
- Review job descriptions and determine the core knowledge requirements for positions.

5. Operational Optimization

Core Strategies

- Increase tracking of power, chemical and operating costs for major facilities and use to evaluate operational and technological effects and identify improvements.
- Attend annual water and wastewater conferences to maintain awareness of operational and technological improvements and evaluate for timely adoption through life cycle evaluation and impact to operations

6. Financial Viability

Core Strategies

- Maintain data to analyze and understand the full life-cycle components, including depreciation in the rate structure.
- Maintain an effective balance between long-term debt, asset values, operations and maintenance expenditures, and operating revenues.
- Prepare annually a balanced two-year Operating and Capital Improvement Budget, monitor on a monthly basis and report to Board of Directors and staff.
- Update the rate model each year with biennial rate increases generally in the range of 3% to 5%, which provides financial security and maintains a rate structure that is lower than most comparable utilities.
- Conduct long range financial planning to ensure organizational sustainability and quality customer service.
- Maintain cash reserves to sustain short and long-term requirements related to working capital needs, emergency needs, capital replacement and expansion, rate stabilization, and risk management.
- Maintain financial integrity by auditing financial results and internal controls and updating financial accounting policies and procedures on an annual basis.

7. Infrastructure Stability

Core Strategies

- Establish a formal enterprise computerized asset maintenance management system (CMMS) to include critical historical and operational data while meeting independent departmental needs.
- Maintain and enhance assets at the lowest possible life-cycle costs and acceptable risk using an asset repair versus replacement analysis.
- Research latest technology and implement new programs, equipment, and processes where applicable to improve asset management.
- Continue to improve workflow processes to collect accurate information and maintain an efficient asset management system to assist in decision-making.
- Continue to ensure asset repair, rehabilitation, and replacement efforts are coordinated within the community to minimize disruptions and other negative consequences.
- Minimize capital and operating expenditures through prudent maintenance practices.
- Maintain employee accountability for equipment condition through performance evaluations and reviews.

8. Operational Resiliency

Core Strategies

- Focus on routine operations reliability through design, operations and maintenance.
- Strive to maintain continuous service at affordable rates through the implementation of emergency response plan, reserve funds, and insurance.
- Continually improve and maintain an emergency response plan to address potential emergencies that could affect routine operations.
- Ensure adequate emergency back-up power and water supply including generators, water storage facilities, and system redundancy.

9. Community Sustainability

Core Strategies

- Provide services to its customers at affordable rates.
- Efficiently use water and energy resources, promote economic vitality, and engender overall community involvement.
- Maintain and enhance ecological and community sustainability including pollution prevention, watershed and source water protection.
- Expand services to promote economic vitality, environmental enhancement and public health.

10. Water Resource Adequacy

Core Strategies

- Participate with Pee Dee Basin user's group to ensure abundant supply of water available.
- Manage operations to provide for long-term aquifer and surface water sustainability and replenishment.
- Monitor treated effluent discharge levels to maintain acceptable limits and implement land application expansions to reduce effluent discharge into receiving water bodies.

11. Stakeholder Understanding & Support

Core Strategies

- Involve stakeholders in the creation and adoption of the operating/capital budgets and rate structure through public hearings, Board meetings, and employee meetings.
- Disseminate information to educate stakeholders in regards to products, services, programs, and rates via direct mailings and external website.
- Hold employee meetings to increase education of the organization's current financial performance and activities.
- Continually seek input for organizational improvements through committees such as the Employee Advisory Committee, Safety Advisory Committee, Attribute Teams, suggestion box, etc.
- Seek input from customers in regards to product quality and customer service through Customer Satisfaction Surveys.

V. CURRENT OPERATIONS

A. Board of Directors

GSWSA is governed by a nine-member Board of Directors who are residents of Horry County and appointed by the Governor upon the recommendation of the Horry County Legislative Delegation. Board members are appointed to overlapping six-year terms.

The Board is charged with providing water and wastewater services to the county, adopting an annual budget, setting rates and charges, and establishing policies and guidelines relating to how those services are delivered to its customers. Current Board members are:

Sid Thompson, Chairman Benjy Hardee, Vice Chairman John Griggs, Secretary Arnold Johnson, Member Robert Floyd, Jr., Member Liston Wells, Member Wilbur James, Member Robert Rabon, Member Richard Singleton II, Member

B. Staff

The staff is organized into General Administration, which is the office of the Chief Executive Officer, and our main operating divisions:

- Financial and Customer Services
- Engineering and Construction
- Plant Operations
- Field Operations

1. General Administration

The Chief Executive Officer executes the policies, directives, and administrative actions of the Board of Directors and directs the operational and administrative activities of GSWSA. This office also provides communication services on matters relating to policies and



General Administration consists of the following groups



Fleet Services Facility

Maintenance

Administration

Human

Resources

3. Engineering and Construction Division

This division is managed by the Chief Operations Officer. The primary functions are development and implementation of the Capital Improvement Plan (CIP), and coordination of private development. The division consists of the following groups and departments:

- Design Engineering
- New Services Development
- Inspection Services
- Construction & Taps
- Community Development
- Geographical Information Systems
- Property & Right-of-Way Acquisitions
- Safety/Emergency Services

4. Plant Operations Division

This division is managed by the Chief of Plant Operations. Its primary responsibilities are the production of safe drinking water, providing adequate wastewater treatment prior to disposal in receiving streams to meet federal and state standards, providing proper disposal of



residual biosolids in a safe and environmentally productive manner, and coordination with federal and state environmental groups on compliance and permitting, along with establishing permits with Industrial Discharges into GSWSA's wastewater collection system. The division consists of the following groups and departments:

- Water Treatment
- Wastewater Treatment & Disposal
- Agricultural Operations
- Environmental Coordination & Compliance
- Treatment Facilities Maintenance



5. Field Operations Division

This division is managed by the Chief of Field Operations. Its primary responsibilities are delivering safe drinking water to customers, timely and accurate meter readings for billing, and the collection of wastewater from customers for delivery to the wastewater plants. The division consists of the following groups and departments:

- Water Transmission, Distribution and Meter Services
- Wastewater Collection and Transmission Services
- Electrical and Instrumentation Service
- Repairs services



Grand Strand Water and Sewer Authority

Functional Organizational Chart



C. Service Area and Customers

GSWSA's retail service area covers the majority of the land mass in Horry County. Essentially, GSWSA's direct retail service area is any area of Horry County not designated as part of another utility's service area and sewer service to the Centenary Community in Marion County. Additionally, GSWSA has a wastewater service area contract for a portion of Columbus County, NC. Also, water and/or wastewater service is provided by contract for the Towns of Sellers, Marion, Mullins and Nichols in Marion County and Lake View in Dillon County.


1. Retail Customers

GSWSA provides retail water and wastewater service to over 80,000 customers. Each customer is designated according to residential equivalent units or REU's. Based on consumption studies, GSWSA's average residential customer uses 250 gallons of water per day. The following table lists the retail customer classes and the number of customers and REU's in each class.

Retail Customer Base		
Customer Class	Accounts	REUs
Single-Family Dwellings	72,760	84,296
Multi-Family Dwellings	1,272	12,119
Commercial	3,578	16,465
Industrial	54	561
Miscellaneous	2,941	5,688
Inactives	6,217	11,171
Total	86,822	130,300

* Multi-Family Dwellings include apartments, condos, etc.

2. Bulk Customers

The bulk customer designation is given to the class of customers within GSWSA's retail service area that purchase water and wastewater services in large quantities and/or have an internal water or wastewater system further regulated by DHEC. The following tables list bulk customers and their peak quarter average daily consumption.

Bulk Water Customers		
Name	Peak Quarterly Average Daily Gallons	
Pirateland Campground	157,874	
Springmaid Beach Resort	136,042	
Ocean Lakes Utilities	122,606	
Garden City Mobile Home Resort	44,141	
Total	460,663	

Bulk Wastewater Customers		
Name	Peak Quarterly Average Daily Gallons	
Ocean Lakes Utilities	379,424	
Lakewood Camping Resort	168,587	
Springmaid Beach Resort	185,226	
Oceanside Village	161,677	
Pirateland Campground	98,680	
Coastal Carolina University	73,630	
Wolverine Brass Inc.	29,868	
AVX Corporation	2,239	
Garden City Mobile Home Resort	12,463	
Total	1,111,794	

3. Wholesale Customers

Wholesale customers operate water or wastewater utilities outside of GSWSA's service area and purchase service from GSWSA.

The following utilities are receiving wholesale water and wastewater service solely from GSWSA:

- Little River Water and Sewerage Company
- Town of Loris
- City of Conway
- City of Myrtle Beach
- City of North Myrtle Beach (Water)

Additionally, to supplement the water and wastewater capacity from their plants, GSWSA provides contract wholesale services to the City of North Myrtle Beach, Georgetown Water and Sewer District, Bucksport Water Company, and the Town of Tabor City, North Carolina.

The following tables list the wholesale water and wastewater customers, their contracted capacity, and their peak quarter average daily consumption.

Wholesale Water Customers			
	Contracted	Peak Quarter	
	Daily Capacity	Average Daily Flow	
Name	(MGD)	(MGD)	
City of Conway		4.355	
City of North Myrtle Beach	11.200	6.33	
City of Loris	0.600	0.556	
Town of Tabor City	0.100	0.019	
Georgetown County Water	1.150	0.508	
Little River Water & Sewer	4.000	2.277	
City of Myrtle Beach		18.45	

Wholesale Wastewater Customers			
	Contracted	Peak Quarter	
	Daily Capacity	Average Daily Flow	
Name	(MGD)	(MGD)	
Georgetown County Water		0.215	
Little River Water & Sewer	2.300	1.863	
City of Conway		2.563	
City of Myrtle Beach		14.306	
City of North Myrtle Beach	3.000	1.235	
City of Loris		0.597	

D. Facilities

1. Water

Water facilities and services are provided in most areas of Horry County. Most of the system is supplied by a single water treatment plant located on Bull Creek in the southeastern part of the county, supplemented by Aquifer Storage and Recovery (ASR) wells dispersed throughout the service area. Water transmission mains have been installed along most of the county's major transportation corridors. From the major transmission mains, rural lines have been extended to serve existing residents and businesses on a petition for service basis. Myrtle Beach and North Myrtle Beach are supplied by the Myrtle Beach Surface Water Treatment Plant, located on the AIWW near Myrtle Beach. The City of Marion, City of Mullins, and the Town of Nichols are served by wells. The Town of Lake View's water is purchased from Trico Water Company. The following is a listing of the water system's major components.











a. Sources

The main water intake is located on Bull Creek which carries about 60% of the water flowing through the Great Pee Dee and Little Pee Dee Rivers. The Great Pee Dee drains 11,620 square miles in Virginia, North Carolina and South Carolina. The Little Pee Dee which enters the Great Pee Dee River just above Bull Creek drains 2,790 square miles of this drainage area. Minimum flow in the Great Pee Dee just above Bull Creek during the drought of 2002 was approximately 1,100 cubic feet per second or 710 MGD. Average flow in the Great Pee Dee in the past five years was 6,000 cubic feet per second or 3.9 BGD. During the same nine year period, the average flow in the Little Pee Dee was 1,000 cubic feet per second or 646 MGD.

Bull Creek is an abundant source of high quality raw water that is less costly to treat than most of the slow moving low flow rivers in and around Horry County. A second water intake is located on the ICWW in Myrtle Beach. The ICWW is fed from the Great Pee Dee and Waccamaw Rivers.

Marion, Mullins, Nichols, and Lake View wells draw water from the Black Creek Aquifer.

b. Bull Creek Regional Water Plant

The plant is located on a 5,000 acre site in the Bucksport community between the Waccamaw River and Bull Creek. The plant was constructed in 1991 with an initial capacity of 21 MGD. It has since

Bull Creek Surface Water Treatment Plant			
Capacity	Annual ADF	Peak Month	Peak 3 Day
MGD	MGD	ADF	ADF
45	23	30	35

MGD = Million Gallons per day ADF = Average Daily Flow

been expanded to 26 MGD in 1996 and to 45 MGD in 2000. The Bull Creek plant uses a "conventional" treatment process of coagulation, flocculation, settling, filtration, and disinfection. However, this plant is unique in that flocculation and sedimentation occur in a patented up flow clarification process directly followed by Greenleaf filters eliminating the usual piping arrangement. The plant peak 3 day ADF occurred in June 2008 at a flow of 35 MGD. During this same period there was 3.7 MGD of flow being added to the distribution system from ASR & Blend wells concurrently for a total system demand of 38.7 MGD. Fluoride is added to the finished water for recommended dental health protection. The by-product of the treatment process, alum sludge, is thickened and land applied to a designated centipede grass turf farm.

c. Myrtle Beach Water Plant

The plant is located on the ICWW in Myrtle Beach. It was constructed in 1986 with an initial capacity of 21 MGD. It has since been expanded to 45 MGD. The plant also uses a conventional treatment process.

Myrtle Beach Surface Water Treatment Plant			
Capacity	Annual ADF	Peak Month	Peak 3 Day
MGD	MGD	ADF	ADF
45	16	27	30
MGD = Million Gallons per day ADF = Average Daily Flow			

d. Aquifer Storage and Recovery (ASR) Wells

GSWSA is a national leader in the development of ASR technology. This technology allows storing treated surface water in wells during off peak periods for use during emergencies or peak consumption conditions. Currently 17 ASR wells are in operation or under development with a combined storage volume of nearly 800 million gallons available for recovery each year. Treated water can be withdrawn for use from ASR wells at a rate of 15.8 MGD.

e. Blend Wells

GSWSA has 8 groundwater wells, producing 6.7 MGD by blending native groundwater with treated surface water at major entry points to the distribution system.

Aquifer Storage and Recovery Wells		
Locations Current or In Progress		
Location	GPM	GPD
Surfside 3rd Avenue	600	864,000
Studio City	800	1,152,000
Crystal Lakes	750	1,080,000
Prestwick	550	792,000
Pirateland	550	792,000
Watsons Riverside	550	792,000
Burning Ridge	700	1,008,000
Caropines	700	1,008,000
Hwy 501	500	720,000
Carolina Forest	1,075	1,548,000
Tilly Swamp	500	720,000
North Tank	600	864,000
Aynor Park	550	792,000
Chestnut Crossroads	550	792,000
North Booster	600	864,000
Jamestown	700	1,008,000
Daisy	700	1,008,000
Total	10,675	15,804,000

Aquifer Storage and Recovery				
Capacity	Annual ADF	Peak Month	Peak 3 Day	
MGD	MGD	ADF	ADF	
15.8	4.7	6.7	11	
6.7 4 4.7 6.7				
MGD = Million Gallons per Day $ADF = Average$ Daily Flow				

f. Marion System

Marion is served by 8 wells with a total capacity of 5.3 MGD. Average daily flow is 1.2 MGD and peak day is 1.6 MGD.

g. Mullins System

Mullins is served by 6 wells with a total capacity of 3.8 MGD. Average daily flow is .073 MGD and a peak of 1 MGD.

h. Nichols System

Nichols is served by one (1) well with a total capacity .533 MGD. Nichols also has a connection to Marco Water Company as backup for emergencies. Average daily flow is .045 MGD with a peak of .05 MGD.

i. Lake View System

Lake View water is served by Trico Water Company. Average daily flow is .079 MGD and a peak of .09 MGD.

j. Transmission, Distribution, and Storage

Water is distributed to most sections of Horry County through a combination of large diameter transmission mains and smaller distribution lines. Plant treated water is stored in reservoirs and pumped through large diameter pipelines to three areas of the county for storage and distribution. These areas are:

- West area covering western Horry County including Conway, Loris, Aynor, and Green Sea.
- Central/North area covering east Conway including Coastal Carolina University and Carolina Forest.
- South area covering the south strand beaches and Socastee.

Water Pipeline		
Diameter	Miles	
36"	15	
30"	13	
24"	38	
20"	31	
16"	1	
14"	7	
12"	222	
10"	84	
8"	484	
6"	652	
4"	102	
3"	53	
2"	94	

Since the service area covers so many miles, the system is

equipped with major pumping stations at the plant and reservoirs and re-pumping stations to boost the pressure in the remote portions of the distribution system. Water is stored to meet the peak diurnal demands in ground storage reservoirs, elevated storage tanks, and ASR wells.

Elevated Storage		
Location/Name	Capacity (MG)	
North Tank	0.5	
Garden City Tank	0.5	
Carolina Forest Tank	0.5	
Deerfield Tank	0.25	
Surfside 3rd Ave Tank	0.3	
Surfside 10th Ave Tank	0.25	
Caropines Tank	0.25	
Hwy 501 Tank	0.25	
Burning Ridge Tank	0.25	
Adrian Tank	0.25	
Longs Tank	0.1	
Aynor Tank	0.1	
Marion Railroad Avenue Tank	0.2	
Marion Smith Street Tank	0.2	
Marion Zion Street Tank	0.2	
Mullins Industrial	0.3	
Mullins Front Street	0.3	
Spring Mills	0.3	
Nichols	0.15	
Lakeview 12th	0.15	
Lakeview 3rd	0.075	
Total	5.375	

Reservoirs		
Location	Capacity (MG)	
Clearwell at Bull Creek SWTP	0.5	
Clearwell at Bull Creek SWTP	2	
Ground Storage Tank at South PS	5	
Ground Storage Tank at Perry Road PS	5	
Ground Storage Tank at Conway PS	2	
Clearwells at Myrtle Beach SWTP	4	
Marion Ground Storage Tank	1	
Total	19.5	

Booster Pumping Stations								
Location/Name	Capacity (MGD)							
South Finished Water PS @ Plant	20							
North Finished Water PS @ Plant	25							
Coastal PS @ South Reservoir	10							
Central PS @ South Reservoir	10							
Perry PS @ Perry Reservoir	20							
Conway PS @ Conway Reservoir	5							
North Booster to NMB & Little River	5							
Loris Booster from Conway	0.4							
Hwy 905 Booster from Conway to Longs	0.6							
Hwy 9 Booster from Longs to Loris	0.7							
Hwy 319 Booster from Conway	0.7							
International Drive Booster	0.7							
Hwy 9 from Little River	1							
Myrtle Beach Finish Water PS @ Plant	45							
Total	144.1							

2. Wastewater

Wastewater facilities and services are located in most areas of the county. Treatment services are provided by thirteen wastewater treatment plants and one leach field. Wastewater transmission mains have been installed along most of the county's major transportation corridors. From the major transmission mains, rural lines have been extended to serve existing residents and businesses on a petition for service basis. Wastewater facilities and services are also located in the City of Marion, City of Mullins, Town of Nichols, Town of Lake View, Town of Sellers, and the Centenary Community. GSWSA also serves a portion of Columbus County, NC with wastewater facilities.

















a. Wastewater Treatment Plants (WWTPs)

The Schwartz WWTP serves the south strand and east Conway areas. The Myrtle Beach Plant serves the City of Myrtle Beach. The Vereen WWTP serves the northeast area including service to Little River Water and Sewerage Company and parts of North Myrtle Beach. The Conway WWTP serves the City of Conway, the Town of Avnor and the west central portion of the county. The Loris WWTP serves the Town of Loris and the northwestern part of the county. The Mullins WWTP serves the City of Mullins. The Lake View WWTP serves the Town of Lake View in Dillon County. The Nichols WWTP serves the Town of Nichols in Marion County. The Longs WWTP serves the Longs community, and the Bucksport

GSWSA Wastewater Treatment Plants							
			Peak				
		Capacity	Month				
Plant	UOD Lbs/Day	MGD	ADF				
Schwartz	3,202	19.4	16.9				
Myrtle Beach	4,108	22.4	16.9				
Vereen	796	7	5.1				
Conway	303	4	3.5				
Bucksport Regional	NA	5	2.5				
Loris	140	0.7	0.6				
Marion	3,413	6	3.5				
Mullins	530	2.75	2.2				
Lake View	36	0.25	0.39				
Nichols	NA	0.135	0.046				
Longs	221	0.2	0				
Bucksport	84	0.2	0.18				
Green Sea Floyds	NA	0.01	0.012				
Total	12,833	68.05	51.83				

WWTP serves the Bucksport community. A small plant is located in the very northwestern part of the county and primarily serves the Green Sea – Floyds High School, Middle School, and surrounding community.

The following describes each of the wastewater treatment plants:

(1) Schwartz

The Schwartz South Strand Regional Wastewater Treatment Plant, located in the Burgess community inland from Surfside Beach, is the oldest plant in GSWSA's system. The plant receives wastewater from the old Myrtle Beach Air Force Base south to Garden City and Garden City Point and inland to Carolina Forest and Coastal Carolina University area including Forestbrook and Socastee. It is permitted to treat up to 19.36 MGD using a process that combines several different treatment trains and processes. The treated and disinfected effluent is discharged through an outfall that combines with effluent from the Myrtle Beach Treatment Plant and discharges into the Waccamaw River at a site near the Georgetown County line. Some of the Schwartz WWTP effluent is permitted to GSWSA's nearby 210 acre Turf Farm, a 1,600 acre site at the Tip Top Tree Farm located in Bucksport and two local golf courses.

A small portion of the by-product sludge is treated and discharged to the 210-acre Turf Farm where it is sprayed to provide irrigation and nutrients to grow Bermuda turf grass. The remainder is dewatered to provide nutrients for Tip Top Tree Farm and other agricultural sites.

(2) Myrtle Beach

The Myrtle Beach WWTP is the largest GSWSA plant with a permitted capacity of 22.4 MGD, using an activated sludge process to produce advanced secondary effluent. Treated effluent is discharged through an outfall that combines with effluent from the Schwartz WWTP and discharges into the Waccamaw River at a site near the Georgetown County line. Much of the sludge is composted for use on our permitted land application farms. The remaining compost is sold to individuals and landscapers. The plant is located at the end of Mr. Joe White Avenue in Myrtle Beach.

(3) Vereen

The Vereen North Strand Regional WWTP is permitted to treat up to 7.0 MGD using an activated sludge process to produce an advanced secondary effluent, which is discharged to either the AIWW or one of GSWSA's four Carolina Bays. The by-product sludge is treated in a portion of the older treatment plant using a process that treats and dewaters the sludge for composting at the Bucksport Compost Facility and later disposal at GSWSA's land application sites.

The plant is located near the Wampee community and receives wastewater from Little River, Longs, the northern portion of Carolina Forest, and Wampee. The plant also is contracted to accept up to 3.0 MGD from the City of North Myrtle Beach.

(4) Conway

The Conway WWTP is permitted to treat up to 4.0 MGD using an activated sludge process to produce an advanced secondary treated effluent that is discharged through Wadus Swamp to the Waccamaw River. The by-product sludge is dewatered and transported to the Bucksport Compost Facility for later disposal at GSWSA's land application sites. The plant is located near Lake Busbee off Hwy 701 South and receives wastewater from the City of Conway and the Town of Aynor as well as most of western Horry County not served by other plants.

(5) Bucksport Regional

The Bucksport Regional WWTP is permitted to treat up to 5.0 MGD using an activated sludge process that includes total nitrogen removal. The treated effluent is discharged into 10 separate Rapid Infiltration Basins (RIB's) or onto the existing Tip Top Tree Farm. Solids are dewatered and processed at the Bucksport Compost Facility located adjacent to this plant and later disposed of at GSWSA's land application sites. The plant is located in Bucksport and receives wastewater from Bucksport, south Conway and the Burgess areas.

(6) Marion

The Marion WWTP is permitted to treat up to 6 MGD using an activated sludge process. Treated effluent is discharged to the Pee Dee River. Solids are dewatered and transported to the Bucksport Compost Facility for later disposal at GSWSA's land application sites. The plant is located in the southeastern part of town behind the Marion High School.

(7) Mullins

The Mullins WWTP is permitted to treat up to 2.75 MGD using an activated sludge process. Treated effluent is discharged into the Little Pee Dee River via White Oak Creek. Solids are digested in two aerobic digesters and applied at an adjacent GSWSA owned land application site where Coastal Bermuda grass is harvested as hay. The plant is located on the southeastern side of the City of Mullins.

(8) Lake View

The Lake View WWTP has two separate discharge permits, one to a land application site, and one to the Lumber River via the Bear and Ashpole swamps. The land application permit is for 270,000 GPD, while the river discharge permit is for 250,000 GPD. The plant consists of a 5 acre aerobic lagoon and intermittent sand filters to complete nitrification and solids reduction. The by-product sludge is treated in the lagoons and is stored until it is removed for disposal at GSWSA's land application sites. The plant is located on the eastern side of the Town of Lake View, behind the Lake View High School and receives only wastewater from the Town of Lake View.

(9) Loris

The Loris WWTP is permitted to treat up to 700,000 GPD and uses lagoon treatment followed by filtration to produce an advanced secondary effluent for discharge into Pleasant Meadow Swamp. The by-product sludge is treated in the lagoons and is stored until it is removed for disposal at GSWSA's land application sites. The plant is located on the western edge of Loris and receives wastewater mostly from the town.

(10) Nichols

The Nichols WWTP is permitted to receive 135,000 GPD and uses lagoon treatment with secondary effluent being discharged into the Lumber River. The by-product sludge is treated in the lagoons and is stored until it is removed for disposal at GSWSA's land application sites. The plant is located on the eastern side of the Town of Nichols and receives wastewater from the Town of Nichols.

(11) Bucksport

The Bucksport WWTP plant is permitted to receive up to 200,000 GPD and uses a lagoon treatment system to produce secondary effluent for discharge to the Tip Top Tree Farm land application site. A limited amount of the treated effluent can be discharged to the nearby Waccamaw River. The by-product sludge is treated in the lagoons and is stored

until it is removed for disposal at GSWSA's land application sites. The plant is located on the southern end of the Bucksport community and receives wastewater from the Bucksport community as well as surrounding areas. This plant will ultimately be shut down after operation of the Bucksport Regional WWTP has been implemented.

(12) Longs

The Longs WWTP is permitted to receive up to 200,000 GPD and uses a lagoon treatment system to produce a secondary effluent that is permitted for discharge to the Waccamaw River. Since 2008, the treated effluent has been diverted to the Vereen WWTP. The by-product sludge is treated in the lagoons and is stored until it is removed for disposal at GSWSA's land application sites. The plant is located in the Longs community and receives wastewater from the Longs community as well as surrounding areas.

(13) Green Sea-Floyds

The Green Sea-Floyds WWTP is permitted to treat up to 15,450 GPD and uses a lagoon treatment system to produce secondary effluent for discharge to a land application site. The by-product sludge is treated in the lagoons and is stored until it is removed for disposal at GSWSA's land application sites. The plant is located off Highway 9 just east of the Green Sea-Floyds High School.

(14) Centenary

Centenary leach field is permitted for disposal of 29,500 GPD or a corresponding maximum of 70 taps or service connections. This system includes a 3.5 acre underground leaching system. The plant is located on the northeastern portion of Centenary and receives flows from the Centenary community and Creek Bridge High School.

b. Collection and Transmission

GSWSA owns 860 miles of combined gravity sewer. The gravity sewer is primarily a conventional gravity system except the small diameter sewers with settling tanks serving Longs, Bucksport, Centenary and Burgess Communities. Gravity sewer flows to pumping stations connected through 847 miles of pressure transmission mains to treatment plants.

Pumping stations are grouped as follows:

Residential – 4,351 pumping stations that serve only one or two customers.

Subdivision - 661 subdivision pump stations each having a 5 or 6 foot wet well, two pumps, and associated gravity sewer generally designed to serve a small area consisting of one subdivision. A few serve more than one subdivision, serve adjacent properties, or serve only part of a larger subdivision.

Re-pumping - 75 re-pumping stations receive wastewater from one or more subdivision pump stations. Many receive wastewater from only one or two other pump stations. However, several regional re-pumping stations serve much larger areas.

Wastewater Booster Pumping Stations					
Pump	Capacity				
Station	MGD	Area Served			
PS 1	6.5	Surfside to Air Force Base			
PS 2	3.0	Surfside to Georgetown County			
PS 3	3.5	Socastee			
PS 4	0.8	Pirateland Campground			
PS 10	2.0	Former Air Force Base			
PS 16	1.5	Ocean Lakes Campground			
PS 99	0.9	Lakewood Campground			
PS 319	1.5	River Oaks and Carolina Forest			
PS 115	2.5	Little River and Wampee Region			
PS 135	1.0	River Oaks			
PS 225	4.0	Forestbrook and AFB			
PS 253	15.0	Carolina Forest to Surfside Beach			
PS 243	1.5	Burcale			
PS 175	1.0	Fantasy Harbour			
PS 153	1.0	Aynor			
PS 171	1.5	Surfside			
PS 539	0.7	Tabor City to Longs			
PS 578	2.0	West Marion			
PS 583	1.8	East Marion			
PS 597	0.5	Town of Nichols			
PS 605	1.5	Hwy 905 and Hwy 90			
PS 615	1.5	West Mullins			

(1) Marion

The City of Marion has 54 miles of gravity collection line, 27 miles of force main with 19 pump stations.

(2) Mullins

The City of Mullins has 53 miles of gravity collection line, 15 miles of force main with 116 pump stations.

(3) Nichols

The Town of Nichols has 6 miles of gravity collection line, 1.6 miles of force main with 8 pump stations.

(4) Lake View

The Town of Lake View has 11 miles of gravity collection line, .05 miles of force main with 1 pump station.

(5) Centenary

The Community of Centenary has 1.8 miles of gravity collection line, 2 miles of force main and 2 pump stations. Centenary has solid settling tanks and effluent is discharged to a spray field for treatment.

(6) Sellers

The Town of Sellers has 1.7 miles of gravity collection line, 6 miles of force main and 1 pump station. Sellers' sewer is pumped to the Town of Latta for treatment.

c. Land Application

Land application of treated wastewater and sludge by-products from water and wastewater treatment processes are a major component of GSWSA's disposal strategy. As regulations and criteria for discharges directly into rivers become more stringent, alternative disposal strategies are critical to finding cost effective and environmentally compatible disposal methods. GSWSA has developed effluent and sludge management plans for over 9,000 acres of land throughout Horry County, 130 acres in Marion County, and over 100 acres in Dillon County.



(1) Socastee Sod Farm

The Socastee Sod Farm was the first sod farm developed by GSWSA. It was developed and expanded concurrently with the Schwartz WWTP to handle the biosolids from the plant and use part of the plant effluent for irrigation needs. The 415 acre site has 210 acres permitted and used for disposal of treated biosolids and effluent to aid in the production of 419 Bermuda sod. About 50 acres may be developed for future biosolids disposal and the remainder is buffer, storage lagoons, and wetlands. The farm operates three storage lagoons, an 8 MG aerated lagoon for temporary storage of excess Schwartz plant influent or effluent, a 10 MG lagoon for storm water, and a 6 MG lagoon for storm water or effluent. The farm also operates 0.6 MG of aerated biosolids storage tanks.

GSWSA sold 905,719 square feet of Bermuda sod last year.

(2) Bucksport Sod Farm

The Bucksport Sod Farm was developed concurrently with the Bull Creek Surface Water Treatment Plant to dispose alum sludge and backwash water. Subsequently it has been permitted for disposal of Myrtle Beach water plant alum sludge and treated wastewater biosolids from several of GSWSA's smaller treatment plants. The 490 acre site has 341 acres permitted for alum sludge and 175 acres of that is permitted for wastewater biosolids and compost to aid in the production of centipede sod and various other crops. About 50 acres may be developed for sludge reuse in the future and the remainder is buffer and wetlands.

GSWSA sold 1,008,835 square feet of centipede sod last year.

(3) Tip Top Tree Farm

This 4,464 acre site is about half wetlands and half uplands. DHEC has permitted 1,600 acres of sandy upland soils as acceptable for tree farm irrigation with 10.5 MGD of treated effluent from the Schwartz and Bucksport WWTPs. Currently 700 acres are used to dispose of up to 5 MGD of effluent from these facilities to aid in the production of pine trees and coastal Bermuda grass for hay production. The site has several colonies of Red Cockaded Woodpeckers and 300 acres are set aside as Safe Harbor areas for the protection and propagation of this endangered species. Approximately 800 additional acres are used for biosolids reuse.

(4) Yauhannah Tract

This 3,226 acre site has approximately 1,200 acres of uplands tree farm with the remainder being riverine and isolated wetlands. The site was purchased in 2004 and is permitted for bio-solids application to enhance tree growth.

(5) Carolina Bays

This 700 acre site at the Vereen WWTP consists of four Carolina Bays ranging in size from 130 to 250 acres. These Bays were originally permitted by the EPA and DHEC as an innovative and alternative method of wastewater treatment and disposal. These wetlands are now only occasionally used as a backup for effluent application from the recently upgraded plant.

(6) Green Sea – Floyds Land Application Site

This 66 acre site has about 5 acres of upland that is used for the treatment and disposal of wastewater from the Green Sea-Floyds High School, Middle School, and surrounding community. The remainder of the site is wetlands and buffer.

(7) Mullins Land Application Site

This 128.5 acre site is permitted for biosolids disposal from the Mullins WWTP aerobic digestion process that is applied to coastal Bermuda grass for hay production.

(8) Lake View

This 100.75 acre site is permitted for 270,000 GPD of treated effluent disposal from the Lake View WWTP. Coastal Bermuda grass is grown and harvested as hay at this location.

3. Support Facilities

a. Office, Maintenance and Inventory Facilities

Grand Strand Water and Sewer Authority's Administrative Office is located just off Highway 544 on Jackson Bluff Road. The 23,000 sqft facility was completed in Winter of 2005 and houses GSWSA's administrative, financial and customer services, and engineering divisions.

The former Administrative Office is now currently the Operation's Office, which is located adjacent to the Administrative Office. This 10,000 sqft facility houses staff for the water and wastewater operations and maintenance, technical services, inspection, construction, and meter reading service departments.

The Repairs staff is now housed within the former 5,000 sqft Construction Building, which is located behind the Operation's Office.

At the end of 2008, three new facilities were completed which included the Fleet Services Shop, Inventory Warehouse, and Pump Repair buildings. The Inventory Warehouse is comprised of 13,585 sqft and is designated for the storage of GSWSA's inventory supplies and construction materials. The Fleet Services Shop is 6,154 sqft and is used for the maintenance and repair of all vehicles, equipments, trailers, and additional smaller equipment. The Pump Repair Building is a 2,375 facility in which the Wastewater

Operations Department uses for the maintenance and repair work of existing pump stations.

In 2010, a new Operations compound was completed for the Field Operations Division. The compound included two (2) - 1,800 sqft metal buildings used for storage and workshop space for the Water and Sewer Field Operators. Two sheds were also completed totaling 12,350 sqft and are used for equipment storage such as generators and by-pass pumps.

As the service area expanded into Marion and Dillon Counties, a need for a central Field Operations compound was realized. In 2015, an office/safety training building was completed and is comprised of 2,925 sqft. The building houses field operations groups and serves as the Emergency Operations Center for Marion and Dillon Counties. The compound also includes 4,410 sqft of shed area to store equipment. The compound site includes an existing 5,000 sqft wood building that was upgraded and now serves as storage for the field operations staff.

b. Fleet

Having more than a 1,200 square mile service area served by approximately 300 employees requires GSWSA to maintain a fleet of vehicles suited for the many varying activities required to provide quality water and wastewater services. GSWSA currently maintains a fleet of over 220 service vehicles.

c. Equipment

GSWSA maintains its own construction and repair crews that regularly construct and maintain the entire water and wastewater system. Using in-house construction crews allows GSWSA to extend new services at a lower cost and to respond more quickly to make repairs on damaged facilities. To support these activities, GSWSA maintains a full line of heavy equipment including but not limited to backhoes, trackhoes, tractors, dozers, boring machines, and trailers. GSWSA currently maintains approximately 456 pieces of heavy equipment.

d. Laboratories

Water labs are located at the Bull Creek Water Plant and the Myrtle Beach Water Plant. Wastewater labs are located at the Schwartz, Vereen, and the Bucksport Regional Wastewater Treatment Plants. Minor labs are also located at the Conway, Marion and Mullins Wastewater Treatment Plants. These labs are fully equipped to provide all routine analysis required for the continued operation of our water and wastewater systems.

E. Financial Position

The Comprehensive Annual Financial Report for Fiscal Year ending June 30, 2014 resulted in an unqualified audit from the accounting firm of Elliott Davis, LLC. GSWSA also received the Government Finance Officers Association's Certificate of Achievement

for Excellence in Financial Reporting for the 25th consecutive year. The following information was taken from the 2014 annual report.

The improvement in the national and local economy affected GSWSA's growth and our financial condition remained strong at year-end with adequate liquid assets, reliable plants and systems to meet demand, and a reasonable level of unrestricted net assets. The

current financial condition, operating and long-term plans and the capabilities of staff are well balanced and enable GSWSA to meet customer needs now and well into the future. The following charts summarize the balance sheet.

During fiscal year 2014, total assets grew \$14.0 million or 2.0% with approximately \$13.5 million represented by additions to capital assets. Net position increased

\$10.3 million,



with substantially all of the change resulting from an increase in new investments in capital assets of \$10.8 million. Unrestricted net assets increased \$5.6 million or 4.8%.

During fiscal year 2013, total assets decreased by \$9.8 million or 1.4% with \$6.9 million represented by a decrease in deferred cash outflows, which was largely due to the change in the fair market value of the interest rate swap. Net position increased overall by \$5.0 million, with substantially all of the change resulting from capital contributions restricted to capital activity and debt service. Unrestricted net assets increased approximately \$6.0 million or 5.4%.

Accounts receivable at year-end, 2014, decreased by approximately \$0.6 million from year-end 2013. Accounts receivable at June 30, 2013 were more than year-end 2012 by \$2.7 million. The 2014 decrease is due to the accrual of less water and wastewater revenues at year-end.

1. Operating Revenues

Revenues from operations fall into two general categories: (1) charges for services, which include: water and wastewater volume, and availability fees, customer charges, surface water treatment plant charges, tap fees, sod sales and (2) other revenues, which include: timber sales, engineering fees and miscellaneous fees. GSWSA has three classes of water and wastewater customers: wholesale, residential and commercial. The following chart depicts GSWSA revenues for the last three fiscal years.

GSWSA

increased retail water and wastewater rates by 2.8% and 5.7% respectively in 2014. It also increased wholesale water rates by 6.12% from \$.98 to \$1.04 and wholesale wastewater rates were increased by various percentages as specified by contract. During 2013, GSWSA did not increase retail water and wastewater rates or wholesale water rates. However,



it did increase wholesale wastewater rates by various percentages as specified by contract. During fiscal year 2012, GSWSA increased retail water or wastewater rates by 3.3% and 4.5% respectively. It also increased wholesale water rates by 6.5% from \$.92 to \$.98 and wholesale wastewater rates

by various percentages as specified by contract.

2. Operating Expenses

GSWSA operates and maintains a potable water treatment and distribution system and a wastewater collection and treatment system. The water production occurs at its two 45 million gallon per day surface water treatment plants. GSWSA has backup wells to use for peak management. The wastewater system includes thirteen wastewater treatment plants that range in size from 10,000 gallons per day to 22.4 million gallons per day.

Total operating expenses of GSWSA increased approximately \$1.4 million over fiscal year 2014, and operating revenues increased by \$5.3 million. Operating expenses for water and wastewater operations for the last three years are listed below:

	2014	Q	/o	2013	%	, O	Variance	2012	%	Variance
Personnel Costs	\$ 20,321,453	2	9.5% \$	19,536,316	28	8.9%	\$ 785,137	\$18,011,198	28.9%	\$1,525,118
Contractual Services	13,608,744	1	9.7%	13,721,247	20	0.3%	(112,503)	11,414,221	18.3%	2,307,026
Supplies and Materials	10,847,474	1	5.7%	10,408,212	15	.4%	439,262	9,409,350	15.1%	998,862
Depreciation and Amortization	23,223,172	3	3.6%	23,038,102	34	.0%	185,070	22,761,494	36.4%	276,608
Other	1,035,932		1.5%	963,793	1	.4%	72,139	826,674	1.3%	137,119
Total Operating Expenses	\$ 69,036,775	10	0.0% \$	67,667,670	100	0.0%	\$1,369,105	\$ 62,422,937	100.0%	\$5,244,733

Personnel costs increased \$785,137 or 4.0% from 2013 to 2014. GSWSA granted an average merit increase of 3% during 2014 and the number of employees increased from 295 to 300. The increase in personnel costs was a result mainly of the merit increases, increase in number of employees and health insurance costs. Contractual services decreased by \$112,503 due to the outsourcing of printing and mailing customer bills. Supplies and materials also increased \$439,262 or 4.2% due to an increase in chemicals needed to treat the water. Depreciation was up \$185,070 or 0.8% due to addition of assets during fiscal year 2014. Other expenses were up by \$72,139 in 2014 due to an increase in business and travel expenses.

Personnel costs increased \$1,513,193 or approximately 9.0% from 2012 to 2013. GSWSA granted an average merit increase of 3% during 2013 and the number of employees increased from 283 to 295 or 4.2%. Eleven of the additional employees were a result of the Mullins acquisition. The increase in personnel costs was a result mainly of the merit increases and the increase in number of employees. Contractual services increased \$2.3 million or 20.2%, primarily as a result of an increase in costs expensed from the capital budget. Supplies and materials also increased \$998,862 or 10.6% mainly due to the repair and maintenance of water and wastewater facilities as well as a higher chemical costs associated with the acquisition of the City of Mullins and Lake View. Depreciation was up \$276,608 or 1.2% due to addition of assets during fiscal year 2013. Other expenses increased by \$149,044 or 7.7% in 2013 due to an increase in business and travel expenses along with other miscellaneous expenses.

3. Capital Contributions

GSWSA collects water and wastewater capacity fees in order to ensure that current customers do not bear the burden of growth. These fees are paid by new customers and represent on a residential equivalent unit basis the cost of the water and/or wastewater capacity required by the new account. Most of these fees are paid in blocks of capacity purchased by residential and commercial real estate developers and wholesale customers. Prior to GASB 34 implementation, the money and system assets received were recorded as direct contributions to the equity. GASB 34 defines these fees as non-operating revenues and requires reporting the amounts through the Statement of Activities. GSWSA restricts the use of capacity fee revenue to capital investment in its system. GSWSA received the additions to its collection and distribution systems from developers.



The following chart depicts the capacity fee revenue activity.

Capital contributions (impact fees) were over \$5.21 million for 2014 compared to \$4.56 million for 2013. Contributions were up in direct proportion to the increase in the number of new customers added during 2014.

Capital contributions (impact fees) were approximately \$4.56 million for 2013 compared to \$3.65 million for 2012. Contributions were up in direct proportion to the increase in the number of new customers added during 2013.

4. Debt Coverage

In the Bond Resolution, GSWSA covenants and agrees that it will, at all times, prescribe and maintain and thereafter collect rates and charges for the services and facilities furnished by GSWSA, together with other income, that will yield annual Net Earnings in the fiscal year equal to at least one hundred ten percent (110%) of the sum of the annual debt service payments.



Net earnings for debt service are defined as gross revenue including customer impact fees, less operating expenses adjusted for depreciation. The rate covenant in the Bond Resolution obligates GSWSA to review rates not less than once a year and to revise such rates and charges as necessary to meet the coverage test. Revenue bond debt service coverage for fiscal years 2012, 2013 and 2014 were 206%, 147% and 175%, respectively.

5. Capital Assets and Long-Term Debt

GSWSA invested \$13.5 million in plant and equipment during 2014. Wastewater additions included the Bucksport Rapid Infiltration WWTP for \$18.1 million, and the Rural Sewer projects at a cost of \$1.9 million. Water additions included the Highway 501 to International Drive for \$4.5 million and the Rural Water projects at a cost of \$1.3 million. Developer contributions to capital assets were \$3.2 million and capitalized interest was \$509,930. Disposals for 2014 were \$1.8 million.

GSWSA invested \$6.4 million in plant and equipment during 2013. Wastewater additions included the Rural Sewer projects at a cost of \$1.9 million. Water additions included the Myrtle Beach Surface Water Treatment Plant at a cost of \$2.2 million and the Rural Water projects at a cost of \$2.6 million. Wastewater and water additions also included the acquisitions of the City of Mullins and Town of Lake View for \$3.5 million and \$0.8 million respectively. The Developer contributions to capital assets were \$4.0 million and no interest was capitalized during 2013. Disposals for 2013 were \$1.5 million.

During fiscal years 2012, 2013, and 2014, GSWSA obtained State Revolving Fund loans for the Bucksport Rapid Infiltration WWTP and Highway 501 to International Drive water line projects. As of June 30, 2014, the draws made on these loans and recorded debt was \$18.9 million. The ratio of total debt to capital assets was 43.3% for the fiscal year 2014.

6. Rates and Charges

Raftelis Financial Consultants, Inc, (RFC) a nationally recognized consulting firm specializing in rates in the water and wastewater industry was engaged to access the reasonableness, affordability and competitiveness of GSWSA's current and historical rates and charges. The following is from the RFC report.

Executive Summary

Raftelis Financial Consultants, Inc. (RFC) was engaged by the Grand Strand Water & Sewer Authority (GSWSA) to assess the reasonableness, affordability, and competitiveness of the GSWSA's current and historical water and wastewater rates and impact fees. In providing this assistance, RFC has updated an analysis originally developed in 2005 to determine the impact of the GSWSA's annual adjustments to its water and wastewater rates and charges on the monthly bill of its typical residential utility customer. This analysis was developed based on 33 years of historical user rate and impact fee information provided by GSWSA staff.

This information was also used to develop a comparison of the annual impacts on the typical GSWSA residential customer bill with similar impacts on residential customer bills observed for other water and wastewater utilities in a national survey group during the ten year period from 2004 through 2014. We feel the rate adjustments and customer bill impacts for this national survey group provide an appropriate representation of residential customer impacts for water and wastewater utilities nationwide during this period.

The typical monthly residential bill and impact fees for the GSWSA's are also compared with those of other local utilities in the Grand Strand and Low Country regions of South Carolina. Additionally, the affordability of the GSWSA's water and wastewater rates in relation to the financial capabilities of the residential population of Horry County is evaluated. And finally, appropriate water and wastewater rate adjustment benchmarks or targets are provided for the GSWSA to use in assessing its anticipated rate adjustments over the next 10 years.

This report is organized into the following sections:

- A. Overview of Grand Strand Service Area;
- B. GSWSA Utility Rate History & Comparisons with Other Utilities; and
- C. Benchmarks for Future Rate Adjustments.

In developing our analysis, RFC has worked with GSWSA staff to compile historical rate and customer billing information for the GSWSA and other local utilities in the Grand Strand and Low Country region. Additionally, national utility rate information collected as part of our biennial survey has also been used to develop this analysis. Based on this information and our extensive experience in the water and wastewater industry, the major findings of our analysis include the following:

- ✓ Over the past 20 years the GSWSA has managed to expand its facilities, service area, and customer base while maintaining benchmark rate adjustments and customer impacts that were below the national inflation rate.
- ✓ From 2004 through 2014, the annual increase of 1.25%, from \$18.38 to \$20.82, in the typical GSWSA residential water bill was significantly below the annual average increase of 5.36%, from \$18.06 to \$30.44, observed for the typical water bill for residential customers of our national survey group.
- ✓ During that same 10 year period, the annual increase of 2.44%, from \$20.31 to \$25.84, in the typical GSWSA residential wastewater bill was significantly below the annual average increase of 6.56%, from \$24.46 to \$46.17, for the typical wastewater bill for residential customers of our national survey group.
- ✓ The typical residential water and wastewater customer of the GSWSA from 2004 through 2014 experienced monthly bill increases on an annualized basis that were either below, or consistent with the 3.10% national rate of inflation. Annual rate adjustments and customer impacts within, at, or below inflation fall within our "*exceptional*" benchmark category.
- ✓ The combined water and wastewater bill for a typical GSWSA residential customer is below the average bill for typical residential customers of other local utilities and it represents the most affordable of any of the utilities included in the local comparison group.
- ✓ The current GSWSA impact fees are the second lowest among the local comparison group for combined water and wastewater impact fees which provides the GSWSA with a competitive position within the Low County region in terms of economic development and affordable housing.
- ✓ Based on residential affordability guidelines, the annual water and wastewater bill for the typical residential customer of the GSWSA in FY 2014 indicates a low financial burden when measured as a percentage of Horry County median household income.
- ✓ RFC has provided separate water and wastewater benchmark rate adjustment forecasts based on historical national inflation rates and utility rate adjustments of the national survey groups. These benchmarks are tailored to provide a range of exceptional, favorable, and unfavorable rate adjustments and impacts for the typical water and wastewater residential customer of the GSWSA.
- ✓ The GSWSA anticipates annualized water and wastewater utility bill increases during the next 10 years of approximately 1.66% and approximately 1.5% during the next 20 years, both of which fall well within our exceptional benchmark range.
- ✓ As part of its plan to address the growth and expansion related portion of its \$758 million water and wastewater capital improvements plan, the GSWSA anticipates annualized adjustments of 1.92% over the next 10 years and 1.83% over the next 20 years to its combined water and wastewater impact fees.

These findings and information are developed and discussed in more detail in the following sections and tables and figures of this report.

A. Overview of Grand Strand Service Area

The GSWSA was created in 1971 as a special purpose district pursuant to the provisions of Act 337 under the authority of the General Assembly of the State of South Carolina. The GSWSA was established to acquire water resources for the purposes of distribution to the local residents and commercial enterprises located within its service area. In

addition, the GSWSA is also directed to build, acquire, construct, operate, and maintain wastewater treatment facilities and collection infrastructure sufficient to meet the needs of its service area and customer base. The GSWSA's current service area includes all of Horry County (County), South Carolina except those areas served by other local municipally owned utilities, as well as parts of surrounding counties.

In the last 30 years Horry County has experienced significant growth as the Grand Strand and Low County region of South Carolina offers a favorable economy and attractive residential lifestyles and communities. Horry County has become a major retirement area and continues to provide the State's largest tourist economy as approximately 65% of the individuals working in the County are employed through the tourism industry. Growth and development in this popular tourism and retirement areas should continue over the next 20 years.

The GSWSA's most significant financial challenge will be providing the capital investment to meet the utility needs of a rapidly growing service area in Horry, Marion, Columbus, and Dillon counties. A major portion of these capital investments relate to over \$758 million in water (\$323 million) and wastewater (\$435 million) improvements to meet increased growth and demand and address regulatory issues over the next 20 years. To address these capital investments, the GSWSA has developed a 20 year program of anticipated water and wastewater rate and impact fee adjustments.

B. GSWSA Utility Rate History & Comparisons with Other Utilities

Over the past 35 years, the GSWSA and other utilities have experienced significant financial challenges in providing water and wastewater services to meet increased demand and environmental regulatory requirements. In December 1970, the Environmental Protection Agency (EPA) was formed to address environmental quality issues. Since that time, there has been an increased focus on ensuring that water and wastewater is treated to appropriate levels to protect the quality of streams and waterways.

However, beginning in 1987 the federal grant programs that provided much of the utility funding up to that point were phased out at a time when water and wastewater utilities were faced with significant capital investments to meet increasingly stringent environmental regulations and pressure to extend utility services to new areas. As a result, most utilities have been forced to increase utility rates at an annual rate that has generally exceeded inflationary increases during that period. The most significant factors requiring these utility rate increases include:

- Replacing aging facilities and infrastructure;
- Expanding facilities to meet new growth and/or extending service to areas previously served by wells and/or septic tanks;
- Regulatory mandates to improve treatment standards; and
- Increasing service levels and system reliability to meet customer demands and expectations.

To demonstrate how effectively the GSWSA has addressed these factors, this section discusses the GSWSA's history of rate adjustments and the impact of these annual rate adjustments on residential customers during the ten year period from 2004 through 2014. This historical rate performance is then compared with the historical rate performance of a national survey group of similar utilities from 2004 to 2014 to determine the effectiveness of the GSWSA rate performance in relation to the utility industry. Additionally, the current typical monthly residential bill and impact fees for the GSWSA's are compared with those of other local utilities in the Grand Strand and Low Country region of South Carolina. Finally, the affordability of the GSWSA's current water and wastewater rates in relation to the financial capabilities of the residential population of Horry County is evaluated.

1. GSWSA Historical Utility Rate Performance and Customer Impacts

Despite the regulatory requirements and unprecedented growth and development occurring in its service area over the past 20 years, the GSWSA has managed to expand its facilities, service area, and customer base while providing quality utility services and maintaining "*exceptional*" financial impacts on its long-time residents and existing customers. Specifically, the impact of annualized rate adjustments on the monthly bill for a typical residential customer with 8,000 gallons of consumption per month over the 20 year period between fiscal year (FY) 1994 and FY 2014 was approximately 0.73% for water and 2.44% for wastewater¹. This translates to a total impact of 1.66% on a combined residential water and wastewater bill. As discussed in Section D, a program of rate increases that maintains customer bill impacts that are below the national inflation rate fall within a benchmark category or range that is considered "*exceptional*" in relation to the national average for customer bill impacts.

As Table 1 indicates, the water and wastewater rate adjustments implemented from FY 1994 through FY 2014 have been relatively gradual in nature and have had an exceptional financial impact on the monthly bill for the typical residential customer.

Time Period	Water	Sewer	Total
1994 Through 2004	0.70%	2.45%	1.36%
Most Recent 10 Years (2004 – 2014)	1.25%	2.44%	1.96%
Most Recent 20 Years (1994 – 2014)	0.73%	2.44%	1.66%

Table 1: Residential Impacts of Annualized Adjustments to Typical GSWSA Residential Bill

Note: The annualized increases represent the compounded increase in the typical residential bill between the first year and last year of the period analyzed. The

¹ For the purposes of this report, the term "annualized adjustments" represent the annual compounded increases to the typical residential customer's bill between the first year and final year of the period being considered.

typical residential customer is assumed to have monthly water consumption of 8,000 gallons.

2. Comparison of GSWSA Rate Adjustments with National Survey Group

To put the financial impacts on the Authority's typical residential customer into perspective, the GSWSA asked RFC to assess and benchmark the reasonableness of its recent rate history with that of other national and local water and wastewater utilities. To provide this assessment, water and wastewater rate survey information from the *RFC Biennial Water and Wastewater Rate Survey*² and historical rate information provided by GSWSA staff have been compiled. In addition, this historical information is also used as the basis for developing a forecasted range of future utility rate adjustment benchmarks in Section D.

RFC used biennial rate survey data from 2004 through 2014 for a sample of utilities across the country to determine the residential customer impacts of the average annual water and wastewater rate increases during that period. To determine the annual impact on residential customers, water and wastewater bills were calculated based on water consumption of 1,000 cubic feet per month, or 7,480 gallons per month. This level of demand is similar to the 8,000 gallons per month of usage provided for the typical GSWSA residential customer.

More specifically, the average annual increases in residential customer impacts were developed based on rate data provided by a survey group of 51 utilities for the water bills and 38 utilities for the wastewater bills. From 2004 to 2014, the average annual compound increase in water bills for the typical residential customer in our national survey group of water utilities was 5.36%. By contrast, the annual compound increase in water bills for the average annual increase in residential wastewater bills for the typical residential customer of the GSWSA during that same period was 1.25%. For wastewater, the average annual increase in residential wastewater bills for the national survey group of wastewater utilities was 6.56%. By contrast, the annual compound increase in wastewater bills for the typical residential customer of the GSWSA during that same period was 2.44%.

As discussed above, most utilities in the United States have experienced annual water and wastewater rate increases resulting in customer impacts that generally exceeded annual inflationary increases since the federal grant programs were phased out beginning in 1987. For example, Consumer Price Index ("CPI) data provided by the United States Bureau of Labor Statistics for All Urban Consumers during the comparison period between 2004 and 2014 demonstrated an annual compound increase in inflation of 3.10%. During the comparison period, the national survey groups for both water and wastewater demonstrated customer impacts that exceeded the national rate of inflation. However, the typical residential combined water and wastewater customer of the GSWSA during that same period experienced monthly bill increases on an annualized basis that were either below, or consistent with the national rate of inflation.

² Beginning in 2008, RFC has teamed with the *American Water Works Association* to develop the biennial Water and Wastewater Rate Survey.

Table 2 compares the impact of average annual increases in water and wastewater bills for typical residential customers in our national survey group with the typical residential customer of the GSWSA from 2004 through 2014.

Period: 2004 through 2014	Water	Wastewater
GSWSA	1.25%	2.44%
National Survey Group Average	5.36%	6.56%
CPI (b)	3.10%	3.10%

Table 2: Comparison of Annualized Impact (a) of GSWSA Utility Rate Increases with Survey Group and CPI

- (a) Represents the annual compounded increases to the typical residential customer's bill between the first year and final year of the period being considered.
- (b) CPI for All Urban Consumers.

Based on the comparison of the annualized rate adjustments for the GSWSA from 2004 through 2014 with our national survey groups, the typical residential customer of the GSWSA has enjoyed exceptional financial impacts when compared to similar residential customers on a national level.

3. Comparison of User Charges with Other Local Utilities

The historical comparison discussed above demonstrates that the GSWSA has achieved a 10 year program of combined water and wastewater rate adjustments that would fall within what we define as the *exceptional* benchmark category or range. However, the GSWSA's ability to meet regulatory requirements and provide expanded facilities to meet its growing customer base during this period is only one factor in determining the reasonableness and affordability of the GSWSA utility rates. Although the GSWSA has managed to keep its combined rate adjustments below or consistent with inflation increases during the previous ten years, this does not address the competitiveness of the typical monthly water and wastewater bills for residential customers of the GSWSA with similar customers of other local utilities in the Grand Strand and Low Country region.

To determine the competitiveness of the GSWSA utility rates, RFC has developed a comparison of the typical monthly bills for a residential customer of the GSWSA with those of other local utilities. This comparison was developed based on information provided by GSWSA staff, collected in a February, 2015 survey of the water and wastewater rates and impact fees of other local utilities.

Table 3 presents the monthly water and wastewater bills for residential customers of the GSWSA and ten other utilities located in the Low Country region. Since the GSWSA provides service to customers located in both Horry County and within municipalities located in Horry County, the comparison also provides the monthly bills for customers that are charged outside-city rate differentials by municipally owned utilities. For

purposes of comparison, the typical residential bill is calculated based on 8,000 gallons of water consumption.

	Month	y Resider	ntial Bills (a)
Local Comparison Utilities	Water	Sewer	Combined (b)
Charleston (Outside-City)	\$47.10	\$126.39	\$173.49
Loris (Outside-City)	\$63.86	\$83.25	\$147.11
Charleston (Inside-City)	\$26.59	\$92.53	\$119.12
North Myrtle Beach (Outside-City)	\$56.30	\$52.18	\$108.48
Conway (Outside-City)	\$47.64	\$58.08	\$105.72
Myrtle Beach (Outside-City)	\$36.78	\$58.60	\$95.38
Mount Pleasant Waterworks	\$38.56	\$51.20	\$89.76
Comparison Group Average	\$35.85	\$53.85	\$89.03
Loris (Inside-City)	\$37.50	\$50.70	\$88.20
Beaufort-Jasper County WSA	\$34.68	\$52.00	\$86.68
Little River WSC	\$31.09	\$36.63	\$64.73
Georgetown County WSD	\$26.54	\$35.96	\$57.23
North Myrtle Beach (Inside-City)	\$28.15	\$26.09	\$54.24
Conway (Inside-City)	\$23.82	\$29.04	\$52.86
Myrtle Beach (Inside-City)	\$18.39	\$29.30	\$47.69
Grand Strand WSA (proposed)	\$21.50	\$26.82	\$46.42
Grand Strand WSA	\$20.82	\$25.84	\$44.76

Table 3: Rate Comparison with Other Local Utilities

(a) Monthly bill for an 8,000 gallon residential customer as of February 2010

(b) W&S bill is for a 8,000 gallon water and sewer customer.

- (a) Based on a typical residential customer with monthly water consumption of 8,000 gallons.
- (b) GSWSA residential customers that receive either water or wastewater services solely are assessed the same \$1.90 administrative charge, as this charge is assessed to all utility bills. However, those customers that receive both water and wastewater services are only charged once for the \$1.90 administrative charge.

As demonstrated in Table 3, the current combined water and wastewater bill (as well as the proposed combined bill for 2016 and 2017) for a GSWSA residential customer is significantly below the local comparison group average and represents the most affordable water and wastewater utility services of any of the Low Country utilities included in the local comparison group.

4. Comparison of Impact Fees with Other Local Utilities

The collection and appropriate use of impact fee revenues to fund capital expansions to water and wastewater facilities and infrastructure has been an important component of the GSWSA's ability to provide expanded facilities to meet its growing customer base over

the past 10 to 25 years. Impact fees have been increasingly relied upon by governmental utilities such as GSWSA as a source of financing for capital improvements. The fees are established as one-time charges assessed against new development or new customers as a way to recover part or all of the costs of additional system capacity constructed for their use.

Impact fees can also affect the competitiveness of a community's economic development efforts, as the magnitude of impact fees can influence where development occurs in certain regions. Therefore, a comparison of the GSWSA's water and wastewater impact fees to similar fees assessed to new customers of other local utilities provides a benchmark when considering the impact of these capital charges on economic development and affordable housing in the region.

Table 4 provides a comparison of the residential water and wastewater impact fees assessed by the GSWSA with nine other utilities in the Low Country region.

	I	mpact Fee	s (a)
Local Comparison Utilities	Water	Sewer	<u>W&S</u>
Mount Pleasant Waterworks	\$2,000	\$4,500	\$6,500
North Myrtle Beach	\$3,195	\$2,682	\$5,877
Charleston	\$2,590	\$2,940	\$5,530
Myrtle Beach (Outside-City)	\$1,701	\$2,321	\$4,022
Beaufort-Jasper County WSA	\$1,200	\$2,760	\$3,960
Little River WSC	\$750	\$2,800	\$3,550
Comparison Group Average	\$1,278	\$1,910	\$3,188
Myrtle Beach (Inside-City)	\$1,134	\$1,547	\$2,681
Georgetown County WSD	\$1,240	\$1,130	\$2,370
Georgetown County WSD (Neck)	\$990	\$1,250	\$2,240
Conway (Outside-City)	\$1,000	\$1,200	\$2,200
Conway (Inside-City)	\$1,000	\$1,200	\$2,200
Loris (Outside-City)	\$750	\$1,125	\$1,875
Grand Strand WSA (proposed)	\$565	\$1,240	\$1,805
Grand Strand WSA	\$550	\$1,210	\$1,760
Loris (Inside-City)	\$500	\$750	\$1,250

Table 4: Impact Fee Comparison with Other Local Utilities

(a) Local communities are sorted from highest to lowest based on the combined total for water and wastewater impact fees.

As demonstrated in Table 4, the current GSWSA impact fees are significantly below the local comparison group average for combined water and wastewater impact fees. Additionally, based on historical impact fee information, the annualized adjustments to the GSWSA impact fees over the past 10 to 25 years are similar to the adjustments to user rates and charges, typically being consistent with the national inflation rate. As a result, past, current, and proposed impact fees provide the GSWSA with a competitive

position within the Low Country region in terms of economic development and affordable housing.

5. User Rate Affordability

As discussed above, the water and wastewater user rates for the GSWSA are very competitive in relation with other local utilities in the Low Country region. However, it is also useful to evaluate the affordability of the water and wastewater rates in relation to the financial capabilities of the residential population of Horry County. RFC's method for measuring the affordability of residential customer's bills is derived in part from the guidelines described in the EPA's 1997 publication #EPA832-B-97-044, "Combined Sewer Overflow Guidance for Financial Capability Assessment and Schedule Development". This publication describes procedures for evaluating the affordability of residential utility rates.

In addition, RFC has reviewed numerous affordability studies as part of our assistance to other utilities interested in assessing rate affordability and has found that affordable rates are generally considered to result in typical residential bills for both water and wastewater that are no more than 4.0% of median household income (MHI). Therefore, customer bills that do not exceed this affordability threshold can imply that the rates are affordable. This measurement is also consistent with the EPA's residential affordability indicator. The EPA indicator measures the average residential bill as a percentage of the community's MHI. The resulting percentage is an indicator of how much annual residential income is dedicated to paying water and wastewater utility bills. The EPA guidelines recommend the ratios presented in Table 5 to indicate different levels of financial burden³:

Financial Burden	Residential Bill as a Percentage of MHI
Low	< 2%
Medium	2% to 4%
High	> 4%

Table 5: Residential Affordability Burden of Utility Rates

Based on 2013 American Community Survey data from the United States Census Bureau, MHI for the typical resident of Horry County was \$42,075. This statistic is based on 2013 information and has been escalated to reflect more current wages and salaries for 2014. As such, RFC has escalated the 2013 MHI by the South Region Urban CPI annualized inflation rate of 0.006% for the period from December 2013 through

³ The EPA and other guidelines often consider water and wastewater bills independently and identify a 2.0% of MHI threshold for each. Therefore, when considering the combined water and wastewater bill for a utility, RFC uses a combined 4.0% of MHI threshold.

December 2014. This provides an estimated MHI for the typical resident of Horry County in 2014 of \$42,327. Using the EPA's residential affordability guidelines, an <u>annual</u> water and wastewater bill of \$537.12 for the typical residential customer of the GSWSA in FY 2014 indicates a *low financial burden* (1.27%) when measured as a percentage of estimated 2014 MHI.

Table 6 presents the calculation of residential affordability for the typical GSWSA residential customer based on the EPA and generally accepted utility industry guidelines.

Table 6: Residential Affordability Burden of Utility Rates

Residential Affordability	
Horry County MHI (estimated for 2014)	\$42,327
Typical Residential Bill (annual) (a)	\$537.12
Residential Bill as a Percentage of MHI	1.27%

(a) Based on a residential customer with a typical monthly consumption of 8,000 gallons.

VI. FUTURE PLANS

A. Economic Outlook

Horry County and the Coastal Carolinas are now recovering from a deep recession with high unemployment and a severe downturn in the real estate market. However, prior to the recession, the area was growing at a pace surpassed by only a few communities in the country. Tourism has grown to become the county's largest employer. The county has also become a major retirement community and is considered to be one of the top places for retirees to live. Tourism continues to grow with many major attractions complimenting the miles of beachfront known as the Grand Strand. Over 100 golf courses are operating within the county with an estimated 4 million rounds played annually expanding the summer tourism season well into the spring and fall. Retail shopping has become another major attraction for the area. In addition to two full scale shopping malls and several factory outlet centers, the county has specialty and tourist shopping at Barefoot Landing and Broadway at the Beach. The newest shopping mall, Coastal Grand opened in 2004 as part of a multi-county business park which includes residential developments, golf courses, retail shopping, and an industrial park located in the Cool Springs community in the western part of the County. During the height of the tourism season, over 450,000 visitors are here daily in addition to the 235,000 permanent residents. The tourism industry now employs approximately 70 percent of the working population of the county.

Long constrained by its lack of major roads and transportation, the county has recently added and upgraded its highway system. The Conway By-pass was completed in 2001 and the north-south connector known as the Carolina Bays Parkway opened in 2002.

Additionally, both Highways 501 and 544 have been upgraded as well as many other road improvements to help bring visitors to and around the Grand Strand. Also, interstate connector I-73 which is planned to begin in Michigan and terminate in Myrtle Beach is in the early funding and planning stages. In total, over \$1.1 billion has been spent improving the road network with another \$1.2 billion planned during the next 10 years.

The county's industrial base is also growing though at a more modest rate than the tourism industry. The county has several industrial parks including the Atlantic Center, the Loris Industrial Park, the Cool Springs Industrial Park and an aviation park located adjacent to the Myrtle Beach International Jetport. A marine park is in the early planning stages in the Bucksport community. The park should be able to take advantage of the Intra-Coastal Waterway and its proximity to the port of Georgetown.

Once the recession lifts and our economy returns to more normal conditions, the area is expected to resume growing at a steady pace with a diversity of business venues and residential and commercial development. If properly managed, the growth should be sustainable and allow the community to prosper in a very stable financial environment for years to come. The demand for services will continue to grow proportionately with the overall growth of the county's tourism industry and permanent resident population. The challenge for GSWSA is to meet the increasing demand for water and wastewater service in a responsive and affordable manner while maintaining the environment and natural resources that attract visitors and residents alike to the area.

B. Population and Growth Projections

Water and wastewater capacity requirements are based on the population and growth projections for Horry County as identified by the Horry County Comprehensive Plan and the Waccamaw Regional Council of Governments. The population projections through the year 2035 are shown in the following table.

Waccamaw Region Population Projections										
County Census Divisions	1970	1980	1990	2000	2010	2015	2020	2025	2030	2035
Aynor	5,634	7,190	6,786	8,909	10,052	10,603	11,185	11,799	12,446	13,129
Conway	18,665	23,868	26,648	33,575	39,715	42,527	45,537	48,761	52,213	55,909
Conway East	3,419	8,546	17,408	31,639	65,364	67,013	68,704	70,437	72,214	74,036
Floyds	3,420	3,771	2,943	3,195	3,301	3,151	3,007	2,870	2,740	2,615
Little River	4,960	8,781	17,833	26,315	33,652	37,833	42,535	47,820	53,762	60,442
Longs	2,788	3,299	3,338	5,625	6,645	7,150	7,693	8,278	8,907	9,584
Loris	9,895	11,137	11,189	13,785	15,878	16,597	17,348	18,134	18,955	19,813
Myrtle Beach	21,211	34,827	57,908	73,587	94,684	104,846	116,098	128,557	142,354	157,632
Horry County Total	69,992	101,419	144,053	196,630	269,291	289,720	312,107	336,656	363,591	393,160

Source Notes

Actual population numbers from U.S. Census 1970, 1980, 1990 ,2000 and 2010.*

 $P \ opulation \ projections \ for \ county \ to \ tals \ for \ 2035, \ provided \ by \ South \ Carolina \ Budget \ and \ Control Bo \ ard, \ 10/2010.$

P opulation projections for intermmediate years from onterpolation. P rojections based on linear regression -using foreast formula that considers time

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Some previous projections included some figures adjusted by the State Data Center

C. Water Flow Projections and Capacity Requirements

To determine water flow and capacity requirements, the population projections for the county are divided into service areas based on facilities needed to provide services. Previous flow data for water is correlated to known populations from the census data. Future flows and capacity requirements are projected based on both population growth projections and providing service to the existing unserved population base.

	Water Flow Projections and Capacity Requirements										
		>2014 Peak Month ADF	>2014 Peak Day	2020 Peak Month ADF	2020 Peak Day	2025 Peak Month ADF	2025 Peak Day	2030 Peak Month ADF	2030 Peak Day	2035 Peak Month ADF	2035 Peak Day
South Strand	Retail	10,476,613	12,571,935	11,867,940	14,241,528	13,167,522	15,801,027	14,609,413	17,531,296	16,209,196	19,451,036
	GCWSD	592,213	710,656	670,861	805,033	744,322	893,187	825,828	990,994	916,260	1,099,511
	Subtotal	11,068,826	13,282,591	12,538,801	15,046,561	13,911,845	16,694,214	15,435,242	18,522,290	17,125,456	20,550,547
Southeast 501	Retail	4,060,314	4,872,377	4,599,537	5,519,444	5,103,202	6,123,843	5,662,021	6,794,426	6,282,033	7,538,440
	Conway	2,204,745	2.645.694	2,497,542	2.997.051	2.771.032	3.325.238	3.074.470	3.689.364	3.411.135	4.093.362
	Subtotal	6.265.059	7.518.071	7.097.079	8.516.494	7.874.234	9,449,081	8,736,491	10.483.789	9,693,168	11.631.802
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Northeast 501	Retail	5 200 547	6 240 657	6 031 041	7 237 249	6 823 569	8 188 283	7 720 242	9 264 290	8 734 745	10 481 694
	Conway	44 727	53 673	51 870	62 244	58 686	70 423	66 398	79 677	75 123	90 147
	Subtotal	5 245 275	6 294 329	6 082 910	7 299 492	6 882 255	8 258 706	7 786 640	9 343 968	8 809 868	10 571 842
	Subtotui	5,215,275	0,291,529	0,002,910	7,277,172	0,002,255	0,250,700	7,700,010	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	0,007,000	10,571,012
North Huzy 90	Retail	2 195 696	2 634 836	2 546 335	3 055 602	2 880 944	3 457 133	3 259 524	3 911 /28	3 687 852	1 125 122
Norun nwy 90	NMP	2,175,070	2,054,850	2,540,555	3 870 705	2,000,744	4 358 127	4 080 013	4 006 815	4 603 810	5 524 583
	Subtotal	4,002,512	5,002,215	5,225,002	6.026.206	6 512 717	7 815 260	7 249 526	9 919 242	9 201 671	0.050.005
	Subiolai	4,995,512	5,992,215	5,771,997	0,920,390	0,312,717	7,815,200	7,548,550	8,818,245	8,291,071	9,950,005
Little Diron	IDWSC	2 650 422	2 190 520	2 055 741	2 666 880	2 440 450	4 129 550	2 972 612	4 6 4 9 2 2 5	4 261 200	5 222 550
	LKWSC	2,030,433	5,180,520	3,033,741	3,000,889	5,440,439	4,128,330	3,8/3,012	4,048,555	4,301,300	5,255,559
T	D . t . I	1.0(7.252	1 280 822	1 227 802	1 495 262	1 400 450	1 690 551	1 594 401	1 001 290	1 702 706	2 151 247
Longs	Retail	1,007,332	1,280,823	1,237,802	1,483,302	1,400,439	1,080,331	1,384,491	1,901,589	1,792,706	2,131,247
C	D . t . I	414 742	407 (01	490.074	577.1(0	544 179	(52.014	(15 (99	729.925	(0(504	925.012
Conway	Retail	414,/43	497,691	480,974	577,169	544,178	653,014	015,088	/38,823	696,594	835,913
	Conway	2,279,051	2,734,862	2,643,001	3,1/1,601	2,990,313	3,588,376	3,383,265	4,059,918	3,827,853	4,593,424
	Subtotal	2,693,794	3,232,553	3,123,975	3,/48,//0	3,534,491	4,241,390	3,998,953	4,/98,/43	4,524,448	5,429,337
	D . 1					0.66.0.54					
Loris	Retail	660,742	792,890	766,258	919,510	866,951	1,040,341	980,875	1,177,050	1,109,770	1,331,724
	Loris	586,963	704,356	623,073	/4/,688	654,856	785,827	688,260	825,912	723,368	868,042
	Subtotal	1,247,705	1,497,246	1,389,331	1,667,197	1,521,807	1,826,168	1,669,135	2,002,963	1,833,139	2,199,766
		1				· · · · · · · · · · · · · · · · · · ·					
Aynor	Retail	304,958	365,949	353,658	424,389	400,131	480,157	452,712	543,254	512,202	614,642
G.S./Floyds	Retail	30,496	36,595	35,366	42,439	40,013	48,016	45,271	54,325	51,220	61,464
	_										
NMB	NMB	5,801,830	6,962,196	6,689,055	8,026,865	7,531,206	9,037,447	8,479,384	10,175,261	9,546,938	11,456,325
MB	MB	17,761,036	21,313,243	20,119,758	24,143,709	22,322,943	26,787,532	24,767,386	29,720,863	27,479,503	32,975,404
Marion		1,000,000	1,100,000	1,030,378	1,133,415	1,056,396	1,162,035	1,083,071	1,191,378	1,110,420	1,221,462
Mullins		860,000	946,000	886,125	974,737	908,500	999,350	931,441	1,024,585	954,961	1,050,457
Nichols		50,000	55,000	51,519	56,671	52,820	58,102	54,154	59,569	55,521	61,073
Lakeview		65,472	72,019	67,461	74,207	69,164	76,081	70,911	78,002	72,701	79,972
Total Retail		26,386,933	31,466,773	29,954,391	35,741,721	33,313,850	39,767,932	37,069,813	44,269,818	41,269,922	49,304,546
Total Contract		34,718,815	41,662,578	39,576,562	47,491,875	44,145,590	52,974,708	49,247,616	59,097,139	54,945,299	65,934,359
Total		61,105,748	73,129,350	69,530,954	83,233,596	77,459,440	92,742,640	86,317,429	103,366,957	96,215,221	115,238,905

D. Water Capital Improvement Plan Summary

The water plan is based on providing facilities to meet the peak daily flow of over 115 MGD, which is the projected water demand for all of Horry County and portions of Marion and Dillon counties in the GSWSA service area in 2035. The plan anticipates acquiring Bucksport Water Company as a wholesale water customer because of the high fluoride content in its well water supply.

The plan is for GSWSA to continue to serve as both a wholesale and retail provider of water services. Projected wholesale water customers are:

- City of Myrtle Beach
- City of North Myrtle Beach
- City of Conway
- Town of Loris
- Little River Water and Sewerage Company
- Bucksport Water Company
- Georgetown County Water and Sewer District
- Tabor City

Since GSWSA will be providing wholesale service in these areas, capital improvements internal to these utilities are not considered in the CIP. If any utility decides to merge with GSWSA, the plan will be revised accordingly.

The City of Marion was merged with GSWSA in 2010 and the Town of Mullins in 2012. Both of these systems have excess capacity for water and wastewater beyond participated growth to 2035 and are not considered to impact the CIP. The Town of Nichols has one (1) well with a capacity of .533 MGD and a 150,000 gallon elevated storage tank. Plans are to connect the Nichols system to Horry County's Grand Strand Regional system to assist in future growth and fire flow with rural water line extensions in the Northwestern areas of Horry County.

a. Water Plants

The combined capacity for the Bull Creek Water Plant and the Myrtle Beach Water Plant is 90 MGD. Current summer demands are approximately 60 MGD. This excess plant capacity combined with the ASR well capacity available for peak periods will allow deferring plant expansions to the very latter part of the planning period.

(1) Myrtle Beach Water Plant

Plans are to expand the Myrtle Beach Water Plant by 15 MGD to 60 MGD if necessary. The plant uses a conventional water treatment process of coagulation, flocculation, sedimentation, filtration, and disinfection. The plant also uses ozone as part of its intermediate treatment process. Plans are to expand the plant using similar or compatible technology. Sludge by-products from the process are currently dried on site and hauled to GSWSA's land application site and turf farm in Bucksport. This will continue with the expanded plant.

(2) Bull Creek Water Plant

Plans are to expand the Bull Creek Water Plant by 15 MGD to 60 MGD. Based on current flow projections, expansion of the plant will not be required during the planning period. The plant uses a conventional water treatment process of coagulation, flocculation, sedimentation, filtration, and disinfection. However, this plant is unique in that flocculation and sedimentation occur in a patented up flow clarification process and are directly followed by Greenleaf filters eliminating the usual piping arrangement. Plans are to expand the plant using an updated version of this process. Sludge by-products will be disposed onsite at the Bucksport turf farm.

b. Transmission Piping and Pumping Improvements

Transmission piping will primarily be line extensions to those remote areas where service is not currently available and line size upgrades for growth in those areas where service is now available. Specific line extensions are listed below along with estimated costs. Additionally, a line is planned to interconnect with the City of Myrtle Beach water distribution system across the AIWW at Bob Grissom Parkway. Plans are also included to upgrade existing water pumping stations and adding new pumping stations to meet pressure requirements as service demands increase.

c. Ground and Elevated Storage Reservoirs

Storage reservoirs are planned to be located throughout the service area to meet fire flow requirements and meet the peak demand from diurnal flow patterns. Reservoirs are planned to provide storage equivalent to 50 percent of maximum daily usage.

d. Rural Water Program

The plan includes continuation of the rural water program installing an estimated 400 miles of rural water lines at a cost of \$50,000,000. The program is based on customer density requirements of the program of 3 customers per mile while limiting the program to the installation of 20 miles per year.

e. Aquifer Storage and Recovery (ASR) Wells

A unique component of GSWSA's water system and future plans is the use of ASR wells drilled into the Black Creek Aquifer. Currently GSWSA has 15.8 MGD of ASR capacity available or under development. The plan projects an additional 20 MGD for a total ASR capacity of 35.8 MGD. The goal is to have a supply of water stored that is equivalent to 70% of Bull Creek's average monthly peak demand. This stored water will be utilized to shave diurnal peak flow over a 5 month recovery cycle and have water available for emergencies should the plant or a major transmission line become unavailable for service.

f. Renewal and Replacement

Plans are made to include sufficient funding to replace equipment and facilities in need of repair or upgrade. The plan and goal is to keep the water system completely up to date with funds set aside for future system upgrades.

g. Contingency

A 20-year plan cannot be expected to be completely accurate and in fact will be updated every five years. Because of inherent difficulties in accurately estimating future projects and the difficulty in predicting accurately what future needs may be, a fund is planned to ensure that sufficient revenue is available to meet future contingencies in the water system.

The following is a list of water projects and costs projected for the Capital Improvement Plan for 2035.

Water Treatment Plants			
Water Treatment Plants			
Water Treatment Plants		Capacity	
		(MGD)	Estimated Cost (\$)
Bull Creek Expansion		60	25,000,000
Myrtle Beach Expansion, Phase II		60	30,000,000
Subtotal		00_	61,000,000
			,
Transmission Piping Improvements	Length (ft)	Size (in)	Estimated Cost
Aynor/Galivants Ferry	21,000	10	630,000
Hwy 9 Duford to Town of Nichols	29,000	12	1,200,000
Holmestown Road to Garden City Tank	13,000	20	2,000,000
International Drive to North Booster	30,500	30	5,000,000
Subtotal			8,830,000
Pumping Improvements		Size (Hn)	Estimated Cost
62nd Avenue Pump Station		3 @ 300	4,000,000
Aynor/Galivants Ferry		2@15	250,000
Conway Pump Station Upgrade		3 @ 250	450,000
Conway Permimeter Pump Station Upgrades		Varies	500,000
Subtotal			5,200,000
Elevated Storage		Size (MG)	Estimated Cost
Calivante Forest		0.5	1,500,000
Huay 19 and Mt Olive Road		0.1	1,000,000
Hwy 90		0.23	1,500,000
Subtotal		0.5	5,500,000
			-,
Rural Water Program	Length (mi)	Size (in)	Estimated Cost
Subtotal	400	6 to 12	50,000,000
System Relocations and Improvements			Estimated Cost
Pipeline Improvements			20,000,000
Weter Tana			7,000,000
Subtotal		-	20,000,000
Subtotal		Size	47,000,000
ASR		(MGD)	Fstimated Cost
Adrian		1	450,000
Backgate		1	450,000
Buist Track Area		1	450,000
Carolina Forest		1	
Content			450,000
Cox Ferry		1	450,000 450,000
Deerfield Tank		1	450,000 450,000 450,000
CoxFerry Deerfield Tank Fantasy Harbour		1 1 1	450,000 450,000 450,000 450,000
Cox Ferry Deerfield Tank Fantasy Harbour Garden City		1 1 1 1	450,000 450,000 450,000 450,000 450,000
Cox Ferry Deerfield Tank Fantasy Harbour Garden City Holmestown		1 1 1 1	$\begin{array}{c} 450,000\\ 450,000\\ 450,000\\ 450,000\\ 450,000\\ 450,000\\ 450,000\\ 450,000\end{array}$
Cox Ferry Deerfield Tank Fantasy Harbour Garden City Holmestown International Drive Little River Area		1 1 1 1 1	450,000 450,000 450,000 450,000 450,000 450,000 450,000
Cox Ferry Deerfield Tank Fantasy Harbour Garden City Holmestown International Drive Little River Area Loris East		1 1 1 1 1 1 1	450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000
Cox Ferry Deerfield Tank Fantasy Harbour Garden City Holmestown International Drive Little River Area Loris East McDowell Shortcut		1 1 1 1 1 1 1 1	450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000
Cox Ferry Deerfield Tank Fantasy Harbour Garden City Holmestown International Drive Little River Area Loris East McDowell Shortcut Myrtle Beach TPI			450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000
Cox Ferry Deerfield Tank Fantasy Harbour Garden City Holmestown International Drive Little River Area Loris East McDowell Shortcut Myrtle Beach TPI Oak Street Pump Station			450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000
Cox Ferry Deerfield Tank Fantasy Harbour Garden City Holmestown International Drive Little River Area Loris East McDowell Shortcut Myrtle Beach TPI Oak Street Pump Station Peachtree		1 1 1 1 1 1 1 1 1 1 1 1	$\begin{array}{c} 450,000\\ 450,0$
Deerfield Tank Fantasy Harbour Garden City Holmestown International Drive Little River Area Loris East McDowell Shortcut Myrtle Beach TPI Oak Street Pump Station Peachtree Surfside Tenth Ave		1 1 1 1 1 1 1 1 1 1 1 1 1 1	450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000
Deerfield Tank Fantasy Harbour Garden City Holmestown International Drive Little River Area Loris East McDowell Shortcut Myrtle Beach TPI Oak Street Pump Station Peachtree Surfside Tenth Ave Vereen Plant		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000
Deerfield Tank Fantasy Harbour Garden City Holmestown International Drive Little River Area Loris East McDowell Shortcut Myrtle Beach TPI Oak Street Pump Station Peachtree Surfside Tenth Ave Vereen Plant Wampee		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	$\begin{array}{c} 450,000\\ 450,0$
Deerfield Tank Fantasy Harbour Garden City Holmestown International Drive Little River Area Loris East McDowell Shortcut Myrtle Beach TPI Oak Street Pump Station Peachtree Surfside Tenth Ave Vereen Plant Wampee Water Lilly			450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000
Deerfield Tank Fantasy Harbour Garden City Holmestown International Drive Little River Area Loris East McDowell Shortcut Myrtle Beach TPI Oak Street Pump Station Peachtree Surfside Tenth Ave Vereen Plant Wampee Water Lilly Subtotal		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 9,000,000
Deerfield Tank Fantasy Harbour Garden City Holmestown International Drive Little River Area Loris East McDowell Shortcut Myrtle Beach TPI Oak Street Pump Station Peachtree Surfside Tenth Ave Vereen Plant Wampee Water Lilly Subtotal		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 50,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000
Deerfield Tank Fantasy Harbour Garden City Holmestown International Drive Little River Area Loris East McDowell Shortcut Myrtle Beach TPI Oak Street Pump Station Peachtree Surfside Tenth Ave Vereen Plant Wampee Water Lilly Subtotal			450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 9,000,000 Estimated Cost 20,000,000
Deerfield Tank Fantasy Harbour Garden City Holmestown International Drive Little River Area Loris East McDowell Shortcut Myrtle Beach TPI Oak Street Pump Station Peachtree Surfside Tenth Ave Vereen Plant Wampee Water Lilly Subtotal Advanced Meter Reading Subtotal			450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 <u>450,000</u> <u>450,000</u> <u>450,000</u> <u>450,000</u> <u>450,000</u> <u>450,000</u>
Deerfield Tank Fantasy Harbour Garden City Holmestown International Drive Little River Area Loris East McDowell Shortcut Myrtle Beach TPI Oak Street Pump Station Peachtree Surfside Tenth Ave Vereen Plant Wampee Water Lilly Subtotal Advanced Meter Reading Subtotal Facility Expansion			450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 9,000,000 Estimated Cost
Deerfield Tank Fantasy Harbour Garden City Holmestown International Drive Little River Area Loris East McDowell Shortcut Myrtle Beach TPI Oak Street Pump Station Peachtree Surfside Tenth Ave Vereen Plant Wampee Water Lilly Subtotal Advanced Meter Reading Subtotal			450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 9,000,000 Estimated Cost 2,500,000
Deerfield Tank Fantasy Harbour Garden City Holmestown International Drive Little River Area Loris East McDowell Shortcut Myrtle Beach TPI Oak Street Pump Station Peachtree Surfside Tenth Ave Vereen Plant Wampee Water Lilly Subtotal Advanced Meter Reading Subtotal Facility Expansion Subtotal Renewal/Replacement			450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 9,000,000 Estimated Cost 2,500,000 Estimated Cost
Deerfield Tank Fantasy Harbour Garden City Holmestown International Drive Little River Area Loris East McDowell Shortcut Myrtle Beach TPI Oak Street Pump Station Peachtree Surfside Tenth Ave Vereen Plant Wampee Water Lilly Subtotal Advanced Meter Reading Subtotal Facility Expansion Subtotal Renewal/Replacement Subtotal			450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 9,000,000 Estimated Cost 2,500,000 Estimated Cost 2,500,000
Deerfield Tank Fantasy Harbour Garden City Holmestown International Drive Little River Area Loris East McDowell Shortcut Myrtle Beach TPI Oak Street Pump Station Peachtree Surfside Tenth Ave Vereen Plant Wampee Water Lilly Subtotal Advanced Meter Reading Subtotal Facility Expansion Subtotal Renewal/Replacement Subtotal			450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 9,000,000 Estimated Cost 2,500,000
Deerfield Tank Fantasy Harbour Garden City Holmestown International Drive Little River Area Loris East McDowell Shortcut Myrtle Beach TPI Oak Street Pump Station Peachtree Surfside Tenth Ave Vereen Plant Wampee Water Lilly Subtotal Advanced Meter Reading Subtotal Renewal/Replacement Subtotal Contingency			450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 9,000,000 Estimated Cost 2,500,000 Estimated Cost 60,000,000
Deerfield Tank Fantasy Harbour Garden City Holmestown International Drive Little River Area Loris East McDowell Shortcut Myrtle Beach TPI Oak Street Pump Station Peachtree Surfside Tenth Ave Vereen Plant Wampee Water Lilly Subtotal Advanced Meter Reading Subtotal Renewal/Replacement Subtotal Contingency Subtotal			450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 9,000,000 Estimated Cost 60,000,000 Estimated Cost 60,000,000
Deerfield Tank Fantasy Harbour Garden City Holmestown International Drive Little River Area Loris East McDowell Shortcut Myrtle Beach TPI Oak Street Pump Station Peachtree Surfside Tenth Ave Vereen Plant Wampee Water Lilly Subtotal Advanced Meter Reading Subtotal Facility Expansion Subtotal Renewal/Replacement Subtotal Contingency Subtotal			450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 450,000 9,000,000 Estimated Cost 60,000,000 Estimated Cost 53,806,000 Estimated Cost

E. Water Capital Improvement Financing Plan

A key component of the CIP is developing a financing plan to ensure that funding is available to construct the projects and also to determine how the costs will affect customers' rates and charges. The water plan projects spending \$322,836,000 for capital improvements over the 20-year planning period.

GSWSA currently has approximately \$95,800,000 in debt and \$64,800,000 in cash reserves for capital spending. Future capital funds will be from the following sources:

- Wholesale customers' monthly capital charges
- Bulk customers' monthly capital charges
- Retail customers' monthly availability and Safe Water charges
- Rural customers' monthly rural water charges
- New customers' impact fees

Based on the combination of fees and charges, GSWSA will be able to implement the \$332,836,000 CIP without borrowing additional funds and with only minor increases in current capital charges.

		Water Capit	tal Financing Pla	n		
	<u>2015</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>	<u>2035</u>	<u>Total</u>
Beginnning Fund Balance	\$ 64,768,796	\$47,365,149	\$ 64,338,910	\$153,295,952	\$270,111,159	
Water Revenues						
Availability	\$12,203,071	\$15,125,753	\$18,411,637	\$ 21,344,134	\$ 24,743,701	\$372,111,465
Demand	204,075	236,171	273,787	317,394	367,947	5,641,444
Rural water Base	485,922	552,432	640,420	742,422	860,671	13,193,555
Bulk Availability	104,738	114,449	132,678	153,811	178,309	2,735,416
MB/Bull Creek Capital	6,840,797	7,086,501	7,824,069	8,638,405	9,537,497	159,168,628
Impact Fees	2,161,039	2,720,384	3,410,067	4,399,052	5,444,282	72,859,580
Water Tap Revenues	1,303,448	1,517,351	1,759,026	2,039,193	2,363,984	36,245,136
Grants	-	100,000	100,000	100,000	100,000	1,800,000
Capital Renewal and Replace	1,656,692	1,724,135	1,998,745	2,317,094	2,686,147	41,272,201
Investment Income	1,295,376	947,303	1,286,778	3,065,919	5,402,223	43,416,392
New debt		-		-		
Total	\$ 26,255,158	\$ 30,124,479	\$35,837,207	\$ 43,117,424	\$ 51,684,761	\$ 748,443,817
Water Expenses						
CIP	\$15,217,141	\$18,537,469	\$ 16,337,469	\$ 25,287,469	\$ 11,337,469	\$322,836,000
Capital Outlay	1,313,887	1,660,755	1,972,455	2,342,658	2,782,343	40,855,894
Debt Service	10,777,754	7,803,301	5,733,823	5,646,093	1,430,522	127,821,512
Total	\$27,308,782	\$28,001,525	\$24,043,747	\$ 33,276,220	\$ 15,550,334	\$491,513,406
Transfer to Operating	\$ -	\$ 450,000	\$ 650,000	\$ 900,000	\$ 1,100,000	\$ 15,500,000
Increase in Fund Balance	\$ (1,053,624)	\$ 1,672,954	\$ 11,143,460	\$ 8,941,204	\$ 35,034,427	\$241,430,411
Debt Service	Ф. ((00.001	• • • • • • • • • • • • • • • • • • •	* 2 7 (2 7 (2	• • • • • • • • • • • • • • • • • • •	¢ 1.000.465	
Principal	\$ 6,690,991	\$ 4,/56,0/6 2,047,225	\$ 3,769,760	\$ 4,/14,076	\$ 1,090,465	
Interest	4,086,763	3,047,225	1,964,063	932,016	340,057	
Principal Balance 6/30	\$95,767,992	\$60,630,467	\$ 37,263,727	\$ 15,662,125	\$ 6,577,026	

F. Wastewater Flow Projections and Capacity Requirements

To determine wastewater flow and capacity requirements, the population projections for the county are divided into service areas based on facilities needed to provide services. Previous flow data for wastewater is correlated to known populations from the census data. Future flows and capacity requirements are projected based on both population growth projections and providing service to the existing unserved population base.

Wastewater Flow Projections and Capacity Requirements						
		>2014 Peak	2020 Peak	2025 Peak	2030 Peak	2035 Peak
		Month ADF	Month ADF	Month ADF	Month ADF	Month ADF
South Strand	Retail	9,350,000	10,591,710	11,751,540	13,038,375	14,466,124
	GCWSD	225,000	254,881	282,791	313,758	348,115
	MB AFB	1,006,000	1,201,217	1,392,539	1,614,335	1,871,456
	Subtotal	10,581,000	12,047,807	13,426,870	14,966,468	16,685,696
Southeast 501	Retail	3,520,000	3,987,467	4,424,109	4,908,565	5,446,070
		, ,	, ,	, ,	, ,	, ,
Northeast 501	Retail	3,500,000	4,058,927	4,592,303	5,195,770	5,878,536
North Hwy 90	Retail	1,365,000	1,573,738	1,771,871	1,994,950	2,246,114
y	NMB	1,900,000	2,190,551	2,466,341	2,776,853	3,126,459
-	Subtotal	3,265,000	3,764,289	4,238,212	4,771,803	5,372,572
Little River	LRWSC	1,710,000	1,971,496	2,219,707	2,499,168	2,813,813
MB	MB	16,900,000	19,144,373	21,240,751	23,566,689	26,147,326
		, ,		, ,		
Bucksport	Retail	140,000	162,357	183,692	196,916	211,091
Conway	Retail	300.000	347 908	303 626	421.962	152 338
Conway	Conway	2 800,000	3 0/3 587	3 262 688	3 497 561	3 749 342
	Subtotal	2,300,000	3 301 405	3,656,314	3 010 523	4 201 681
	Subtotal	5,100,000	5,571,475	5,050,514	5,717,525	4,201,001
Longs	Retail	310,000	359,505	406,747	438,182	472,046
	D 1 1	200.000	001.000	262.415	202 (00	204.546
Aynor	Retail	200,000	231,939	262,417	282,698	304,546
Loris	Retail	10.000	11 597	13 121	14 845	15 525
LOIIS	Loris	500,000	530.760	557 834	586 289	613 152
	Subtotal	510,000	542 357	570.955	601 134	628 677
	Subtotal	510,000	542,557	570,755	001,134	028,077
G.S./Floyds	Retail	6,800	7,886	8,922	10,095	11,421
Marian		2 500 000	2 606 221	2 607 285	2 700 740	2 996 470
Mulling		2 200 000	2 266 821	2 324 071	3,190,149	2 442 024
Nichols		2,200,000	2,200,031	2,324,071	2,382,737	2,442,924
Lakeview		390,000	401 847	411 00/	422 308	433 064
Luncview		570,000	+01,047	T11,77 1	722,370	+55,00 4
Total Retail		24,821,800	27,638,943	30,273,491	33,130,753	36,299,584
Total Contract	t	25,041,000	28,336,865	31,422,651	34,854,653	38,669,663
Total		49,862,800	55,975,808	61,696,143	67,985,406	74,969,247

G. Wastewater Capital Improvement Plan Summary

The wastewater plan is based on providing facilities to meet the peak monthly average daily flow of 75 MGD, which is the projected 2035 wastewater demand for Horry County and service areas within Marion and Dillon counties. The City of North Myrtle Beach will be provided wholesale service from GSWSA's Vereen WWTP to supplement the capacity from the two city owned facilities. GSWSA and North Myrtle Beach have a wholesale contract in place for GSWSA to provide capacity to meet the city's future capacity requirements. Should GSWSA reach an agreement with the City of North Myrtle Beach to acquire the City's two wastewater plants, it will not affect the wastewater CIP since the plants are not projected to be expanded regardless of ownership.

The plan is based on GSWSA continuing to provide wholesale and retail wastewater services. Projected wholesale wastewater customers are:

- City of Myrtle Beach
- City of North Myrtle Beach
- City of Conway
- Little River Water and Sewerage Company
- Georgetown County Water and Sewer District
- Tabor City

Since GSWSA will be providing wholesale service in these areas, capital improvements internal to these utilities are not considered in the wastewater plan. If any utilities decide to merge with GSWSA, the plan will be revised accordingly. City of Marion wastewater system merged with GSWSA in May 2010. The Marion facility has excess capacity expected to be adequate to accommodate growth to 2035. The system has significant inflow which will be reduced through renewal and replacement projects. The Town of Nichols system merged with GSWSA in September 2010. The Nichols facility has excess capacity expected to be adequate to accommodate growth to 2035. The City of Mullins wastewater system merged with GSWSA in October 2012. The Mullins facility has adequate capacity to accommodate growth to 2035. The Town of Lake View wastewater system merged with GSWSA in December 2011. The Lake View facility was expanded in 2014 by an additional flow of 0.070 MGD. Currently the Lake View facility has two discharge permits that if they remain in effect will provide ample capacity to accommodate growth to 2035.

a. Wastewater Plants

Future wastewater plant improvements will involve consolidation or elimination of some facilities, construction of a new treatment plant, and upgrades and expansions of all other plants.

(1) Bucksport/Tip Top Regional WWTP

Bucksport/Tip Top Regional WWTP is a new advanced secondary treatment process plant with nitrogen removal and filtration that assures the high levels of treatment needed for land application. The 2035 capacity is expected to be 15 MGD. Flows to this facility will come from a combination of diversions from Carolina Forest, the south strand, and the areas of Conway and western Horry County. Plants now serving these areas will not be expandable to handle all the increasing flows because of their restricted discharge limits. The land application system at Tip Top provides an excellent disposal site which does not discharge into or increase any loadings to the rivers. A new transmission force main will be constructed to send flows from Carolina Forest, Conway and western Horry County to the Bucksport WWTP.

(2) Myrtle Beach WWTP

Myrtle Beach WWTP has been expanded from 17 to 22.4 MGD with upgrades to advanced treatment levels. There will be a need to expand to 27.4 MGD by 2035 due to expected population growth. The 50-acre oxidation pond which was a major cause of odor at the facility was removed from routine influent flow service. The pond will be used for effluent storage which will reduce the peaks and allow the full 22 MGD to be transported through the existing 36 inch pipeline to the Schwartz WWTP.

(3) Schwartz South Strand Regional WWTP

Schwartz South Strand Regional WWTP will not be the largest facility in GSWSA's system at this time, the Myrtle Beach WWTP will be the highest rated capacity plant. Treated effluent will continue to combine with Myrtle Beach effluent and be discharged through the existing common outfall line into the Waccamaw River. Effluent quality will be upgraded to meet more stringent levels through the addition of treatment basins and clarifiers. Additional influent flows will be diverted to the Bucksport Regional WWTP.

(4) Vereen North Strand Regional WWTP

Vereen North Strand Regional WWTP in Wampee is presently permitted at 7.0 MGD with 2035 flows expected to reach 12.0 MGD. Due to the current UOD capacity 9.5 MGD will be discharged to the Atlantic Intracoastal Waterway and the remaining 2.5 MGD will be discharged into the existing Carolina Bays system. The Vereen WWTP now serves Little River, a portion of North Myrtle Beach, Wampee, and the Northern sections of Carolina Forest. The plant service area will be expanded to encompass the northeastern section of Horry County presently served by the Longs WWTP.

(5) Conway WWTP

The Conway WWTP is permitted at 4.0 MGD and due to the effluent limitations at the discharge into the slow moving, low flow Waccamaw, and the plant cannot be expanded for additional capacity. Any additional flows to the plant will be diverted through a new pipeline to the new Bucksport Regional WWTP. Flows above 4.0 MGD will be piped to the new Bucksport Regional WWTP.

(6) Loris WWTP

The Loris WWTP will remain at 0.7 MGD. To accommodate growth in the City and the Green Sea-Floyds area a new pump station and force main will be installed down Highway 701 to the Conway area.

(7) Green Sea-Floyds WWTP

The Green Sea-Floyds WWTP has been expanded to 15,250 GPD. This expansion included minor plant modifications and added filters. The land application site was expanded to accommodate the additional flows. As the flows increase in the area, a force main will be constructed to connect to the Loris WWTP, and the Green Sea WWTP will be decommissioned.

(8) Bucksport WWTP

The Bucksport WWTP will be decommissioned when the new Bucksport Regional WWTP becomes operational and the flows will be diverted to the new Bucksport Regional WWTP.

(9) Longs WWTP

The Longs WWTP flows have been diverted to the Vereen WWTP. The Longs WWTP will remain in service as equalization and pumping facility.

b. Effluent Disposal

In 1999, DHEC, the Waccamaw COG, and all the major wastewater dischargers in the Waccamaw region agreed to an allocation of waste loads for discharge of treated wastewater into the Waccamaw River and AIWW. The waste loads were developed through a long-term study and mathematical model of the receiving waters in the region. These waste loads were issued for the southern and northern portions of the Waccamaw and AIWW and are expressed as pounds of Ultimate Oxygen Demand (UOD) per day. The UOD is the amount of oxygen demanding

D	DHEC UOD Allocation							
	Pre 1999	Current						
	Allocation	Allocation						
	UOD	UOD						
WW Discharge	pounds/day	pounds/day	% Reduction					
South Strand								
GSWSA Schwartz	7871	3201.9	59.3					
GSWSA Myrtle Beach	13507	4107.9	69.6					
GCWSD	2842	1332.2	53.1					
Total	24220	8642	64.3					
North Strand								
GSWSA	481	517	(7.50)					
Conway								
GSWSA	1873	303	83.8					
Bucksport								
GSWSA	226	84	62.8					

substances that can be assimilated by the waters at critical low flow periods and still maintain the levels of oxygen established by regulations for maintaining healthy coastal rivers with naturally low levels of oxygen. The following table shows the waste loads determined by DHEC and agreed upon by the dischargers.

The following table shows GSWSA plus North Myrtle Beach's 20-year effluent disposal plan.

2035 Wastewater Effluent Disposal									
Region	Plant	UOD Lbs/Day	Capacity MGD	River Discharge	Land Disposal	Treatment Level #			
Southeast		7,310							
	Schwartz	3,202	24.4	19.4	5	1			
	Myrtle Beach	4,108	27.4	27.4		1			
Northeast*		1,859							
	Vereen^	1,017	12	9	3	2			
	NMB Cresent Beach	330	2.9	2.9		2			
	NMB Ocean Drive	512	4.5	4.5		2			
West		587							
	Conway	303	4	4		2			
	Loris	200	1.2	1.2		2			
	Bucksport	84	15	0.5	15	3			
Marion		3,943							
	Marion	3,413	6	6		1			
	Mullins	530	2.75	2.75		1			
Dillon		36							
	Lake View	36	0.27	0.25	0.27	4			
Total		13,735	100.42	77.9	23.27				

* Northeast UOD is sum of 1638 to ICWW at NMB and 221 to Waccamaw at Longs

Treatment level 1 = advanced secondary

Treatment Level 2 = advanced secondary with filtration

Treatment Level 3 = advanced secondary with nitrogen removal and filtration

Treatment Level 4 = secondary followed with filtration

^ Vereen can divert 2.5 MGD from River to Carolina Bays

Southeast UOD allocation shared between Schwartz & Myrtle Beach

Northeast UOD allocation shared between GSWSA Vereen and 2 NMB Discharges

West UOD allocations are established for individual discharges at Conway, Loris and Bucksport

c. Biosolids Disposal

Wastewater treatment produces solids that are rich in natural fertilizers, and agricultural reuse of these treated biosolids provides a beneficial option for disposal. GSWSA has been treating and reusing biosolids to grow sod at the High Tech Turf Farm in Socastee for 32 years. The sod is marketed locally and sales revenue offsets a significant part of the cost of solids treatment. About 25% of the Myrtle Beach generated biosolids are composted and marketed locally with similar benefits. Biosolids are also applied to GSWSA tree farms to grow trees for harvest and sale, along with various other crops.

The projected annual biosolids production for 2035 is over 7,500 dry metric tons (2,205 pounds/DMT). At an average of 30 pounds of plant available nitrogen per DMT, this makes over 225,000 pounds of nitrogen (PAN) available for reuse and recycling. GSWSA will expand current programs so that all future bio-solids generation will continue to be reused.

DMT/YR Biosolids Generated By Plant								
	2014	2020	2025	2030	2035			
Schwartz	2,408	1,633	1,755	1,861	2,168			
Myrtle Beach	1,484	1,627	1,757	1,872	2,227			
Bucksport Regional	-	967	967	967	967			
Vereen	503	815	979	1,125	1,564			
Conway	297	296	314	328	367			
Nichols	1	1	1	1	1			
Green Sea Floyds	0.20	0.22	0.22	0.22	0.22			
Lake View	7	8	8	8	8			
Loris	16	17	17	18	20			
Mullins	111	110	110	111	111			
Marion	83	93	93	93	94			
Totals	4,910	5,567	6,002	6,384	7,527			

The Myrtle Beach WWTP generates about 30% of the total biosolids production, and a regional composting facility was constructed at the Bucksport Regional WWTP so that all the Myrtle Beach biosolids and those from Vereen, Conway, Marion, and a portion from the Schwartz WWTP's is composted for land application on GSWSA farms and minor sales to local customers. The Schwartz WWTP generates 30% of the total biosolids. All Schwartz biosolids are currently digested and used on the sod and tree farms, with a portion going to the Bucksport Compost Facility. Loris, Nichols, and Lake View biosolids are held in treatment lagoons for several years and removed as needed. These are applied to agricultural sites. Marketing of forest, turf, and other agricultural products raised with biosolids will continue to help keep disposal costs down.

Biosolids Disposal Plan DMT/Year								
2014 2020 2025 2030 2033								
Composted for Market	142	150	150	150	150			
Composted for Farms	1,640	4,174	4,761	5,437	6,020			
Digested for Sod Farm	357	350	350	350	350			
Digested for Farms	2,763	1,000	1,000	1,000	1,000			
Hold in Place	8	25	26	27	28			
Total DMT	4,910	5,699	6,287	6,964	7,548			

Biosolids Disposal Plan lbs PAN/Year								
2014 2020 2025 2030 20								
Composted for Market	2,393	2,528	2,528	2,528	2,528			
Composted for Farms	27,643	70,355	80,249	91,644	101,471			
Digested for Sod Farm	21,088	20,674	20,674	20,674	20,674			
Digested for Farms	107,524	100,857	100,857	100,857	100,857			
Hold in Place	88	278	286	292	312			
Total Lbs	158,737	194,693	204,595	215,996	225,842			

d. Transmission Piping and Pumping Improvements

Transmission piping will primarily be line extensions to those remote areas where service is not currently available and line size upgrades for growth in those areas where service is now available. Specific line extensions are listed below along with estimated costs.

Additionally, lines are planned to interconnect with the City of Myrtle Beach's wastewater system from the Market Commons area to the Schwartz WWTP. Plans also include major lines from the City of Conway WWTP and Hwy 544 to the new Bucksport WWTP. Pump stations are planned for upgrades and additions as wastewater flow requirements increase.

e. Rural Wastewater Program

The plan includes continuation of the rural wastewater program installing an estimated 400 miles of rural wastewater lines at a cost of \$50,000,000. Additionally, the plan calls for installing 6,000 single or small service grinder pump stations at a cost of \$30,000,000. The program projects rural customer density requirement at 1 customer for every 1,760 L/F of line extension.

f. Renewal and Replacement

Plans are made to include sufficient funding to replace equipment and facilities in need of repair or upgrade. The goal is to keep the wastewater system completely up to date with funds set aside for future system upgrades.

g. Contingency

A 20-year plan can not be expected to be completely accurate and in fact will be updated every five years. Because of inherent difficulties in accurately estimating future projects and also the difficulty in predicting accurately what future needs may be, a fund is planned to ensure that sufficient revenue is available to meet future contingencies in the wastewater system. The following is a list of wastewater projects and costs projected for the Capital Improvement Plan.

2035 Wastewater Capita	al Improvement	t Plan	
Wastewater Treatment Plants		Capacity (MGD)	Estimated Cost (\$)
Bucksport Composting Facility, Phase III			4,000,000
Bucksport Regional Expansion Phase I (5 MGD Upgrade)		10	28,000,000
Bucksport Regional Expansion Phase II (5 MGD Upgrade)		15	30,000,000
Land Purchase for Biosolids Disposal			1,000,000
Myrtle Beach Expansion (5 MGD Upgrade)		27.4	15,000,000
Schwartz Expansion (5 MGD Upgrade)		22.5	15,000,000
Tip Top Tree Farm Effluent Disposal Improvements			3,000,000
Vereen Expansion (5 MGD Upgrade)		12	12,000,000
Subtotal		-	108,000,000
Transmission Piping Improvements	Length (ft)	Size (in)	Estimated Cost
Conway W WTP to Bucksville Road	47,000	20	5,000,000
Garden City Connector to New 36 to Hwy /0/	11,000	20	2,000,000
Loris WWTP to Hwy 701	18,000	10	700,000
Hwy 31 to Vereen W WTP	19,000	14	1,000,000
Hwy 544 to Bucksville Road	28,000	30	12,000,000
Hwy 9/Green Sea to Loris	60,000	12	2,000,000
Pee Dee to City of Marion	47,500	12	3,200,000
TPI to Hwy 707	25,000	30_	5,000,000
Subtotal			30,900,000
Pumping Improvements		Size (Hp)	Estimated Cost
City of Conway Contract Ungrades		5120 (T)	1.000.000
Conway to Bucksport Pump Station		2 @ 100	500.000
Loris WWTP Pump Station		2 @ 60	150,000
Hwv 701 Bucksville Pump Station		3 @ 125	500,000
Hwy 17 By-Pass to Hwy 707 Pump Station		3 @ 200	750.000
Hwy 90/Hwy 31 Pump Station		2 @ 75	400,000
Pee Dee to City of Marion Pump Station		2 @ 75	400,000
PS 319 Carolina Forest		$2 \overset{\smile}{a} 60$	150,000
Subtotal		<u> </u>	3,850,000
Rural Sewer Program	Length (mi)	Size (in)	Estimated Cost
Rural Sewer lines	400	6 to 12	50,000,000
Single Service Pumping Station	6000		30,000,000
Marion Sewer lines	50	6 to 12	10,000,000
Subtotal			90,000,000
System Relocations and improvements			Estimated Cost
Pipeline Improvements Callection System Slin Lining			20,000,000
Collection System Sup-Lining			7 000 000
Sewer Laps		-	33 000 000
Subiotai			33,000,000
Facility Expansion			Estimated Cost
Subtotal			2.500.000
			 ,,
Renewal/Replacement			Estimated Cost
Subtotal			80,000,000
Contingency			Estimated Cost
Subtotal			87,062,500
Wastewater System Capital Improvements			Estimated Cost
Grand Total			\$435,312,500

H. Wastewater Capital Improvement Financing Plan

A key component of the CIP is developing a financing plan to ensure that funding is available to construct the projects and also to determine how the costs will affect customers' rates and charges. The wastewater CIP projects spending \$435,312,500 for capital improvements over the 20-year planning period.

GSWSA currently has approximately \$120,000,000 in debt and \$45,200,000 in cash reserves for capital spending. Future capital funds will be from the following sources:

- Wholesale customers' monthly capital charges
- Bulk customers' monthly capital charges
- Retail customers' monthly availability and wastewater improvement charges
- Rural customers' monthly rural wastewater charges
- New customers' impact fees
- SRF loans and revenue bonds

The CIP plan includes borrowing \$160,000,000 in additional funds and minor increases to capital charges in order to implement the \$435,312,500 CIP.

Wastewater Capital Financing Plan						
	<u>2015</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>	<u>2035</u>	<u>Total</u>
Beginnning Fund Balance	\$ 45,182,984	\$ 10,534,702	\$ 58,445,021	\$ 47,589,681	\$125,063,980	
Wastewater Revenues						
Availability	\$ 11,166,657	\$ 14,787,751	\$ 18,857,362	\$ 24,841,876	\$ 31,102,426	\$405,908,223
Demand	300,692	346,968	402,231	466,296	540,565	8,288,064
Rural sewer Base	1,049,196	1,181,137	1,369,262	1,587,350	1,840,173	28,213,957
Rural PS	396,511	459,665	532,877	617,751	716,143	10,974,027
Bulk Capital	681,274	866,133	1,104,494	1,455,013	1,821,700	23,774,352
Contract Capital	2,877,979	3,647,787	5,022,469	6,915,207	9,521,230	111,036,163
Impact Fees	4,367,950	5,283,020	6,689,803	8,847,613	11,206,513	145,652,664
Investment Income	903,660	210,694	1,168,900	951,794	2,501,280	18,685,062
New Debt	-	20,000,000	-		-	160,000,000
Total	\$ 21,743,919	\$ 46,783,155	\$ 35,147,398	\$ 45,682,900	\$ 59,250,030	\$912,532,512
Water Expenses						
CIP	\$ 25,656,730	\$ 24,422,776	\$ 37,222,776	\$ 15,822,776	\$ 44,422,776	\$435,312,500
Capital Outlay	1,313,887	1,660,755	1,972,455	2,342,658	2,782,343	40,855,894
Debt Service	11,953,331	15,757,583	16,896,013	18,375,042	13,643,471	326,501,654
Total	\$ 38,923,948	\$ 41,841,114	\$ 56,091,244	\$ 36,540,476	\$ 60,848,590	\$802,670,048
Transfer to Operating	\$ -	\$ 450,000	\$ 650,000	\$ 900,000	\$ 1,100,000	\$ 15,500,000
Increase in Fund Balance	\$ (17,180,029)	\$ 4,492,041	\$ (21,593,846)	\$ 8,242,424	\$ (2,698,560)	\$ 94,362,464
Debt Service						
Principal	\$ 7 885 689	\$ 10.010.705	\$ 10 139 962	\$ 12,079,059	\$ 9.918.128	
Interest	4 067 642	5 746 878	6 756 051	6 295 983	3 725 342	
merest	4,007,042	5,740,078	0,750,051	0,295,985	5,725,542	
Principal Balance 6/30	\$119,663,289	\$133,810,238	\$140,770,089	\$122,290,457	\$ 68,965,856	

I. Support Facilities Capital Improvement Plan

1. Office, Maintenance and Inventory Facilities

As the service area and number of employees continue to grow, existing facilities will need to be upgraded and new facilities constructed. The main Administrative office off Jackson Bluff Road will be expanded to include new office and storage space. The existing Operations Building located behind the Administrative office will become storage space, and a new Operations Building will be constructed directly adjacent to the existing Building. The Operations compound for Field Operations Division will be expanded to include additional workshop space as well as shed storage space for repair inventory parts and equipment.

To continue to provide quality customer service for customers in the Marion and Dillon Counties, a new Marion Administrative office will be constructed within the City of Marion, adjacent to the new Field Operations compound. The existing customer service offices in the City of Marion and Mullins will be consolidated into the new Administrative office.

J. Financial Plans

1. Expense Projections

The financial plan to meet future service needs is based on separating costs and revenues into two distinct categories: Capital and Operating. The capital costs and revenue recovery are presented in detail within the Capital Improvement Plan.

The basis for the operational financial plan is segregating operating costs into service categories in order to more appropriately charge costs on the basis of service provided. For instance, a retail customer is charged based on a differing rate structure than a wholesale customer because an additional level of service is provided. A complex rate-making model has been developed to allocate operating costs into service categories that translate into customer rates.

The goal of the financial plan is to meet customer service needs while holding operating cost increases to levels below inflationary indexes. This will be accomplished by increasing operating efficiencies through a more productive work force and using the most cost effective technology available in the industry. Debt levels will be reduced by minor increases in impact fees and increase in monthly capital charges for wastewater service reflecting the costs associated with more stringent regulatory requirements. GSWSA's goal is to maintain the lowest rates of any water or wastewater utility operating on the coast of South Carolina and to keep rate increases well below the index for inflation.

Forecasting costs are difficult at best because many of the factors affecting costs are unknown. Inflation and increases in regulatory requirements in particular could have a dramatic effect on costs and therefore the rates customers are charged. However, recognizing the potential effect of these factors, cost projections are made in 5-year increments to evaluate what customer rates and charges may be in the future. The projections are made based on a combination of business growth with minor inflationary adjustments. The major "assumption" is therefore that the economic and regulatory environment during the next 20 years will be similar to the past 5 years. If not, the projections can be adjusted accordingly.

The expenses are based on near actual figures for Fiscal Year 2015 and proposed budget figures for 2016 and 2017. Future projections are based on factors indicated above.

Projected Operating Expenses							
	<u>2015</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>	<u>2035</u>		
Number of Years		5	10	15	20		
Expenses							
Personnel costs	\$23,686,195	\$29,156,561	\$35,972,660	\$ 44,486,378	\$ 55,146,562		
Contractual Services	12,862,796	16,867,006	22,117,732	29,003,019	38,031,707		
Supplies and Materials	11,612,336	15,227,275	19,967,551	26,183,483	34,334,444		
Business and Travel Expenses	330,390	341,954	341,954	341,954	341,954		
Construction Materials	-	-	-	-	-		
Other Expense	1,226,461	1,608,260	2,108,914	2,765,423	3,626,304		
Total	\$ 49,718,178	\$ 63,201,056	\$80,508,812	\$ 102,780,256	\$131,480,970		
 Based on 3.5 % salary increase 2,3,5,6 - Based on 3.5 % inflation 4 - Based on 3.5% inflationary increase 	e plus additional en ary increases plus s reases	nployees at 40 % service growth	service growth				
Interest Expense	\$ 8,154,405	\$ 8,794,103	\$ 8,720,114	\$ 7,227,999	\$ 4,065,399		

2. Revenue and Rate Projections

Revenue projections are determined from allocating the projected expenses into the known revenue categories and adjusting the rates as required ensuring that expenses are covered. The following table uses known revenues from Fiscal Year 2015 and projects the revenues and corresponding rates through the year 2035. As seen from the tables below, the projections are for retail customer rates to increase from \$44.76 per month in 2015 to \$60.31 per month in 2035, an average annual increase of 1.50 percent.

		Pro	jected Revenues				
		<u>2015</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>	<u>2035</u>	
Nu	mber of Years		5	10	15	20	
Wa	ter Revenues:						
1 Fire	Flow Availability	\$ 77,906	\$ 92,662	\$ 110,213	\$ 131,088	\$ 155,918	
2 Vol	ume	6,888,754	8,193,543	9,745,470	11,591,346	13,786,847	
3 Exc	ess Volume Charge	625,513	743,991	884,909	1,052,518	1,251,874	
4 Bull	k-Volume	195,309	243,973	304,763	380,700	475,557	
5 Bull	Creek Revenues	9,562,680	11,945,376	14,921,759	18,639,755	23,284,150	
6 Tap	Fees	-	-	-	-	-	
7 Fire	Flow Tap Fees	-	-	-	-	-	
8 Eng	ineering/Inspections	40,894	53,625	70,318	92,208	120,913	
9 Oth	er Revenue	1,073,631	1,407,855	1,846,122	2,420,823	3,174,429	
10 T	otal Water Revenue	\$18,464,688	\$22,681,024	\$27,883,554	\$34,308,439	\$ 42,249,688	
Sev	ver Revenues:						
11 Vol	ume	\$ 9,528,496	\$11,333,275	\$ 13,479,895	\$ 16,033,103	\$ 19,069,911	
12 Exc	ess Volume Charge	763,780	908,446	1,080,514	1,285,173	1,528,595	
13 Ser	vice Line Maintenance Charge	1,554,243	2,763,651	4,914,140	8,737,995	15,537,318	
14 Bull	k Operating	1,070,808	1,337,617	1,670,906	2,087,239	2,607,308	
15 Cor	ntract Operating	6,617,988	8,266,967	10,326,815	12,899,907	16,114,126	
16 Tap	Fees	205.071	270 001	254 170	161.101	(00.000	
17 Eng	ineering/Inspections	205,971	270,091	354,170	464,424	609,000	
18 S00	A seesemente	388,038	509,622	668,268	876,301	1,149,094	
19 Tax 20 Sen	Assessments	200.903	263 444	345 455	-	- 594.014	
20 Sep 21 Oth	er Revenue	200,903	391 358	513 189	672 945	882 434	
21 Out	tal Sawar Bayanuas	\$ 20 648 501	\$ 26 044 472	\$ 33 353 351	\$ 43 510 082	\$ 58 091 801	
22 10	fai Sewer Revenues	\$ 20,048,501	\$20,044,472	\$ 55,555,551	\$45,510,082	\$ 58,091,801	
Gei	neral Revenues:						
23 Cus	stomer Charges	\$ 1,929,833	\$ 1,932,935	\$ 2,299,049	\$ 2,734,509	\$ 3,252,448	
24 Turi	n on/ Turn Off	539,723	540,590	642,983	764,769	909,623	
25 Late	e Payments/Liens	926,786	928,275	1,104,099	1,313,224	1,561,960	
26 Inve	estment Income	2,626,458	2,899,822	3,201,638	3,534,867	3,902,779	
27 Gan	n on Disposal of Fixed Assets	50,000	55,204	60,950	67,293	/4,297	
20 Pair	ber Sales	90,000 5 882 555	7 220 724	0 125 428	121,128	133,733	
29 Keil	tel Conoral Poyonuos	\$ 12 045 356	\$ 13 786 928	<u>9,133,428</u> \$ 16 553 857	\$ 19 920 197	\$ 24.021.885	
50 10	dai General Revenues	\$ 12,045,550	\$15,700,720	\$ 10,555,657	\$19,920,197	\$ 24,021,005	
31 Tota	al Operating Revenues	\$ 51,158,544	\$62,512,425	\$77,790,762	\$97,738,718	\$ 124,363,373	
32 Tota	al Operating Expenses	49,718,178	63,201,056	80,508,812	102,780,256	131,480,970	
33 Op	erating Income	\$ 1,440,366	\$ (688,632)	\$ (2,718,050)	\$ (5,041,539)	\$ (7,117,597)	
34 Trai	nsfer from Water & WW Capital	\$ -	\$ 4,500,000	\$ 6,500,000	\$ 9,000,000	\$ 11,000,000	
35 Net	Operating Income	\$ 1,440,366	\$ 3,811,368	\$ 3,781,950	\$ 3,958,461	\$ 3,882,403	
Pot	tail Sarvica						
Cus	stomer	\$ 1.90	\$ 1.72	\$ 1.86	\$ 2.00	\$ 2.15	
Wa	ter Availability	9.00	10.00	10.50	10.50	10.50	
Wa	ter volume	9.92	10.69	11.51	12.40	13.36	
To	otal Water	\$ 20.82	\$ 22.41	\$ 23.87	\$ 24.90	\$ 26.02	
Sew	ver Availabilty	\$ 8.50	\$ 10.00	\$ 11.00	\$ 12.50	\$ 13.50	
Sew	ver Volume	15.44	16.63	17.92	19.30	20.80	
То	tal Sewer	\$ 23.94	\$ 26.63	\$ 28.92	\$ 31.80	\$ 34.30	
Tot	al	\$ 44.76	\$ 49.04	\$ 52.79	\$ 56.71	\$ 60.31	
100	ar	φ .70	φ τ).0τ	φ 32.17	φ 30.71	φ 00.51	
1,2, 4,14 5,15 6,7, 13 - 19 - 26 -	 1,2,3,11,12,23,24,25 - Based on retail flow growth plus 1.5% rate increase. 4,14 - Based on retail flow growth plus 2.5% rate increase. 5,15 - Based on contract flow growth plus 2.5% rate increase. 6,7,8,9,16,17,18,20, 21 - Based on retail flow growth plus 3.5% rate increase. 13 - Based on retail flow growth plus 10% increase. 19 - Only collected in 2015 then goes away. 26 - Based on factored flows as a combination of retail and contract. 						

27,28 - Based on retail flow growth.

29 - Based on 4.5% increase per year (personnel costs).

To supplement this plan, RFC was asked to look at GSWSA's rate forecast and compare to industry averages and benchmarks. The following is taken from the RFC report.

3. Benchmarks for Future Rate Adjustments

Based on our historical rate comparison, the GSWSA has managed to expand its facilities, service area, and customer base during the period between FY 2004 and FY 2014 while at the same time maintaining a program of water and wastewater rates adjustments that have been better or comparable to the CPI. Furthermore, the GSWSA program of rate adjustments from 2004 to 2014 has easily outperformed the annualized rate increases of our national survey groups during this same period.

However, continued growth and development in Horry County presents financial challenges as GSWSA must continue to provide additional capacity and extend infrastructure to a growing service area and customer base. As part of its continued objective to meet the demands of a growing customer base while seeking to maintain exceptional to favorable financial impacts on its customers, the GSWSA has requested that RFC provide appropriate water and wastewater industry rate adjustment benchmarks or targets that it may use to assess its rate and financial performance in the coming years.

The utility industry has joined the benchmarking movement later than most industry groups. However, the utility industry is undergoing major changes due to deregulation that could potentially increase competition. Also, as environmental regulations become stricter, utilities must increase capital expenditures to achieve compliance. Furthermore, customers and other stakeholders are demanding that utilities maintain affordable rates and charges. These factors have created pressure for utilities to decrease costs. Continuous improvement and benchmarking have, therefore, become increasingly important to water and wastewater utilities.

To provide GSWSA with appropriate water and wastewater rate adjustment benchmarks for the coming years, RFC has forecasted a benchmark range of rate adjustments based on our extensive experience in the water and wastewater industry and the historical data provided by GSWSA staff and though our biennial rate survey. Specifically, RFC has tailored a range of benchmark rate adjustment forecasts for the GSWSA based on its current (FY 2015) water and wastewater rates. Separate water and wastewater rate benchmarks are provided, and each is tailored to provide a range of exceptional, favorable, and unfavorable rate adjustments and impacts for the typical water and wastewater residential customer of the GSWSA.

For water, the benchmark ranges were developed with the typical monthly residential bill of \$20.82 in FY 2015 serving as the basis for our forecast. The <u>exceptional</u> benchmark range is defined as a program of rate adjustments and customer impacts during the period from FY 2015 through FY 2025 that is equal to or below the forecasted rate of inflation. For the purposes of this analysis, inflation is anticipated to continue at a trend of 3.1%, which is based on the All Urban CPI inflationary factors observed during the recent ten year period used for our historical comparison. Similarly, the <u>favorable</u> benchmark range is defined as a program of rate adjustments and customer impacts that is above the forecasted rate of inflation yet below or equal to the average rate adjustments anticipated for similar water utilities throughout the country. For the purposes of this analysis, the average rate adjustments for water utilities throughout the country is anticipated to be consistent with the annualized increases of 5.36% observed for our national survey group from 2004 to 2014, the recent 10 year period used for our historical comparison. Finally, the <u>unfavorable</u> benchmark range is defined as any program of rate adjustments and customer impacts that is above the average rate adjustments anticipated for water utilities throughout the country.

Figure 1 presents the benchmark categories and ranges for water rate adjustments and customer impacts anticipated for the typical residential customer of the GSWSA.



Figure 1: GSWSA Water Rate Impact Benchmarks

For wastewater, the benchmark categories and ranges were developed based on the same methodology and assumptions as the water benchmarks, beginning with the typical monthly residential bill of \$25.84 in FY 2015 serving as the basis the our forecast. The <u>exceptional</u> benchmark range of 3.10% is defined as a program of rate adjustments and customer impacts during the period from FY 2015 through FY 2025 that is equal to or below the forecasted rate of inflation. The <u>favorable</u> benchmark range is defined as a program of rate adjustments and customer impacts that is above the forecasted rate of inflation yet below or equal to the average rate adjustments anticipated for wastewater utilities throughout the country of 6.56%. And finally, the <u>unfavorable</u> benchmark range is defined as any program of rate adjustments and customer impacts that is above the average rate adjustments range is defined as any program of rate adjustments and customer impacts that is above the average rate adjustments and customer impacts that is above the average rate adjustments range benchmark range is defined as any program of rate adjustments and customer impacts that is above the average rate adjustments anticipated for wastewater utilities throughout the country.

Figure 2 presents the benchmark ranges wastewater rate impacts anticipated for the typical residential customer of the GSWSA.



Figure 2: GSWSA Wastewater Rate Impact Benchmarks

As mentioned in Section A, the GSWSA has developed a program of water and wastewater rate and impact fee adjustments as part of its 2035 Plan to address its significant capital investments over the next 20 years. Specifically, it is anticipated that the combined water and wastewater bills for the typical residential customer of the GSWSA will increase from its FY 2015 level of \$44.76 to \$52.79 by FY 2025 and \$60.31 by FY 2035. This translates into annualized increases during the next 10 year period of 1.66% and 1.5% over a 20 year period, both of which fall within the exceptional benchmark range. Similarly, as part of its plan to address the growth and expansion related portion of the \$758 million combined water and wastewater capital improvements during the next 20 years, the GSWSA anticipates annualized adjustments of 1.92% and 1.83% to its combined water and wastewater impact fees over the next 10 and 20 years, respectively.

RFC believes the forecasted benchmark categories and ranges will prove to be useful to the GSWSA over the coming years as it continued efforts to maintain exceptional to favorable annual rate adjustments and customer impacts in relation to other local and national utilities. However, it should be noted that the benchmark ranges presented above were forecasted on historical information from 2004 through 2014. Although historical information is often a reliable indicator of future performance, there will usually be differences between the forecast and actual results as events and circumstances frequently do not occur as expected, and those differences may be material.

K. Organizational and Human Resources Plan

The organizational plan currently in place is anticipated to continue to serve as the basic framework for providing efficient delivery of products and services to customers. However, the organization will continue its flexible approach and adjust according to the needs of customers, the strengths and weaknesses of its employees, and improving technology and business practices.

A major goal of the organization is the development of its employees to meet future needs. As such, emphasis will be placed on hiring the most qualified applicant, and employee training and development. However, as the needs of the organization indicate, qualified employees from other organizations will be hired to complement the existing staff and to broaden the organizations perspective of practices within the water and wastewater utility industry.

Several employees in top level management positions could be retiring within a five to ten year time horizon. A major focus during the next several years will be succession planning to ensure that each management position has at least one employee, qualified and capable of assuming the role when a vacancy occurs. This effort is currently underway with several employees identified for additional education and training.

1. General Administration

The Administration Division will remain relatively stable and will not grow at a pace proportionate to the general customer base or the operating divisions. Some employees may be added in Human Resources as the number of overall employees increase. Fleet Services may increase in employees as the number of vehicles and equipment service requirements increase.

2. Financial and Customer Services Division

This division should grow at a pace substantially less than the overall customer base. Accounting will continue to remain stable in its growth. Billing and Customer Service Departments will continue to be directly affected by customer growth. Enhanced technology and other innovative programs will continually be analyzed to maintain as small and efficient staff as possible. The Purchasing and IS Departments will remain stable in its future growth and should not be affected proportionately by the growth of the general customer base.

3. Engineering and Construction Division

The Engineering Departments of this division, such as Design and New Services, for the most part will remain stable and will not increase with the overall increase in customer base. An additional Professional Engineer has been added to the design staff to assist in implementing the CIP. The CIP calls for spending \$758,148,500 over the 20-year period.

This high level engineer has been added to assist in the implementation of this aggressive capital improvement program. In addition, the Geographic Information System (GIS) Department has also been expanded to assist in the implementation of a new asset management program. As the water and wastewater systems continue to grow, a reliable asset management system is critical.

Also, Inspections Department will increase by several employees in response to new construction projects as well as developments and new customers added to the system over the 20-year period. The Construction & Taps Department is also anticipated to remain stable and will maintain a construction schedule similar to current workloads. However, the Taps group is expected to grow by several employees as the system continues to expand and additional customers connect to the system.

4. Plant Operations Division

This division has several departments that will grow very little and some that will grow at nearly the rate of customer increase. The Environmental Coordination and Compliance Department is stable and is not expected to increase. The water treatment staff will not increase due to increased flows but will increase with the expansion of both the Myrtle Beach SWTP and the Bull Creek SWTP. Likewise the wastewater treatment staff will increase to staff the expansions of several of the wastewater treatment plant expansions. Agricultural Operations will increase slightly, specifically due to the increase in sludge production and disposal needs. This is due to the fact that the labor required for biosolids transport and disposal is proportional to the production rate, a greater proportion of the biosolids are produced at more distant facilities, which impacts average transport times. The treatment facilities maintenance staff will increase due to the fact that with expansions there will be more equipment maintenance needs, along with aging facilities maintenance demands.

5. Field Operations Division

This division has several departments that will grow very little and some that will grow at nearly the rate of customer growth. The Electrical and Instrumentation and the Repairs Department should grow much less than the customer growth.

Meter Services with the application and installation of Advance Meter infrastructure technology should initially decrease this department and then growth would be at a rate much less than customer growth.

Water Transmission and Distribution should grow slightly less than customer growth. With the addition of producing water during summer months through ASR to shave peak, and with the addition of facilities from growth and expansion, aging ASR and water line, flushing of rural lines, increase in service line maintenance agreement and more stringent regulatory requirements additional staff will be needed.

Wastewater collection and transmission staff will increase slightly more than the rate of customer growth. Rural sewer systems require more frequent service per customer than traditional gravity sewer systems, and projected expansion of the rural system will

increase staff proportionately. Increased maintenance of aging facilities, more stringent regulatory requirements, and expansion of the customer service line maintenance program will also contribute to increases in maintenance staff.